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Graduate School of Management

Master in Corporate Finance Program

**“ACCRUAL-BASED AND REAL EARNINGS MANAGEMENT AT
RUSSIAN COMPANIES: RELATIONSHIP WITH CORPORATE FINANCIAL
PERFORMANCE”**

Master’s Thesis by the 2nd year student
Concentration – Master in Corporate Finance
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

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Название ВКР	Манипулирование прибылью в российских компаниях методом дискреционных начислений и на основе реальных операций: взаимосвязь с финансовой результативностью компаний
Образовательная программа	Корпоративные финансы
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Описание цели, задач и основных результатов	<p>Цель исследования состоит в изучении влияния манипулирования прибылью методами дискреционных начислений и на основе реальных операций на финансовую результативность компаний.</p> <p>Для достижения цели исследования и формирования лучшего понимания явления манипулирования прибыли были сформулированы следующие задачи:</p> <ul style="list-style-type: none">– установление факта наличия манипулирования прибылью и определение условий, в которых компании склонны манипулировать прибылью;– установление взаимосвязи между манипулированием прибылью методом дискреционных начислений и на основе реальных операций, и выявление факторов, которые влияют на выбор в пользу того или иного метода;– определение последовательности, в которой применяются вышеуказанные методы;– выявление характера взаимосвязи между манипулированием прибылью и финансовой результативностью в разрезе методов манипулирования прибылью. <p>В выборку включены 170 российских нефинансовых компаний, чьи акции обращаются на фондовой бирже и которые публикуют финансовую отчетность в соответствии с МСФО. Анализируемый период составляет 10 лет с 2011 по 2020 гг.</p> <p>В ходе исследования были получены следующие результаты.</p> <p>Во-первых, было выявлено, что компании, с прибылью едва превышающей нулевое значение (прибыль находится в диапазоне 0 - 1% от валовых активов на начало года) или компании с незначительным ростом прибыли к предыдущему</p>

	<p>году (изменение прибыли находится в диапазоне 0 - 1% от валовых активов на начало года), демонстрируют признаки завышения прибыли. Кроме того, было выявлено что компании, которые стремятся перейти за нулевой порог по прибыли, склонны к манипулированию прибылью на основе реальных операций, в то время как компании, которые стремятся показать рост прибыли к предыдущему году, предпочитают манипулирование прибылью на основе дискреционных начислений.</p> <p>Во-вторых, было выявлено, что манипулирование прибылью методом дискреционных начислений и на основе реальных операций являются взаимозаменяемыми, и выбор в пользу той или иной стратегии зависит от возможностей менеджеров применить тот или иной метод, от финансового состояния компании, а также от экономической и нормативно-правовой среды. Вопреки ожиданиям, качество внешнего аудитора, срок, в течении которого компания беспрерывно аудируется одним аудитором, и доля институционального владения не показали статистически значимой взаимосвязи ни с одной из стратегий манипулирования прибылью.</p> <p>В-третьих, было доказано, что оба метода применяются последовательно. Сначала используется метод на основе реальных операций, а после закрытия финансового года, применяется метод на основе дискреционных начислений для калибровки результата. Однако, соотношение между тем или иным методом определяется факторами, описанными выше, а уровень манипулирования прибылью методом дискреционных начислений дополнительно зависит от результата управления прибылью на основе реальных операций.</p> <p>В заключении, было обнаружено, что манипулирование прибылью на основе реальных операций негативно влияет на финансовую результативность компаний. Однако, не удалось выявить взаимосвязь между финансовой результативностью и манипулированием прибылью методом дискреционных начислений. Отраслевой анализ выявил аналогичные закономерности. Энергетические и сырьевые компании, которые манипулировали прибылью на основе реальных операций, в следующем году имели более низкую рентабельность по сравнению с компаниями-аналогами, менее вовлеченных в управление прибылью данным методом.</p>
Ключевые слова	Манипулирование прибылью методом дискреционных начислений, манипулирование прибылью на основе реальных операций, финансовая результативность, целевые ориентиры по прибыли, Российские компании

ABSTRACT

Master Student's Name	Berezhnoi Aleksandr
Master Thesis Title	Accrual-based and Real Earnings Management at Russian Companies: Relationship with Corporate Financial Performance
Educational Program	Master in Corporate Finance
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Academic Advisor's Name	Nikulin Egor D., Associate Professor, Department of Finance and Accounting
Description of the goal, tasks and main results	<p>The goal of the thesis is to investigate the influence of accrual-based and real earnings management on subsequent company performance.</p> <p>In order to achieve the research goal and to form a better understanding on the phenomenon of Earnings management, a number of objectives were formulated:</p> <ul style="list-style-type: none"> – establishing the presence of earnings management and determination of the setting, in which companies tend to manipulate with earnings; – discovering the relationship between earnings management strategies (accrual-based vs. real) and defining the factors that influence on the choice of either strategy; – identification of the timing patterns in which earnings management strategies are used; – understanding how either of earnings management strategies affects subsequent corporate performance. <p>The data sample includes all Russian public non-financial companies, which publish financial statements prepared under IFRS. Data is analyzed over a period of 10 years from 2011 to 2020.</p> <p>Firstly, it was revealed that companies, whose earnings are slightly above zero (<i>earnings are in range 0 – 1% of lagged total assets</i>) or slightly higher than previous year earnings (<i>year-on-year change in earnings is in range 0 – 1% of lagged total assets</i>), show signs of upwards earnings management. Moreover, it was revealed that a need to meet zero earnings benchmark induces real earnings management behavior, while a last year earnings benchmark is associated with accrual-based earnings management.</p> <p>Secondly, results showed that real and accrual-based earnings management have a substitutive nature, and the choice of either strategy depends on accounting flexibility, company financial health and external economic and regulatory environment. Quality and tenure of external auditor and institutional ownership showed</p>

	<p>no significant association with neither of earnings management strategies, contrary to the expectations.</p> <p>Thirdly, it was proven that both strategies are used in a sequence, with real earnings management used first until the year-end, and after the fiscal year end, managers might apply accrual-based earnings management to fine tune the result. However, the proportion in which both strategies are used is still influenced by the factors described above and the magnitude of accrual-based earnings management additionally depends on the outcome of real earnings management.</p> <p>Finally, it was found that real earnings management negatively influences on subsequent operating performance, measured with ROA adjusted for industry median. However, no conclusion was made regarding the accrual-based earnings management and its relative influence on performance as compared to real earnings management. Industry analysis revealed similar patterns. Companies from “Energy” and “Basic materials” sectors which practiced real earnings management had a weaker next year profitability as compared to profitability of the peer-companies less involved in real earnings management.</p>
Keywords	Accrual-based earnings management, real earnings management, financial performance, earnings benchmarks, Russian companies

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INTRODUCTION

Earnings is perhaps the most important and the most powerful figure in whole set of financial statements. It is the main characteristic of a company performance and has a direct influence on its stock price. Earnings are closely monitored by investors and analysts, and if actual earnings fall short of market expectations, the stock price usually falls, unless a company provides convincing explanations. Besides, earnings are the determinants of management remuneration, directly or indirectly through the stock options. An interest to earnings may also stem from creditors, regulators, customers and suppliers.

Being under heavy pressure to report constantly growing earnings, managers are tempted to “decorate” financial statements and to report figures that might show a skewed picture of the company performance. It gives rise to a phenomenon of Earnings Management, an object of this study. It would be fair to note that earnings are not always managed upwards, and at times, they might be pulled down, for example, in order to create “cookie jar” reserves or for tax purposes. There exist the two earnings management strategies: accrual-based earnings management and real earnings management. The main difference between them is the influence on company operations and cash flows. Accrual-based earnings management does not affect the operational activities and is of purely accounting nature, while real earnings management presumes the interference with normal business processes and transactions. There are multiple techniques for either strategy that will be covered in details in the theoretical part of this thesis.

It is important to emphasize that earnings management is different from a fraud. Earnings management is a legal practice within the boundaries of accounting standards which provide a certain level of leeway for the accountants. The main idea behind contemporary accounting frameworks such as IFRS is the economic substance over form. In order to meet this goal, managers are required to apply their expert judgement. Since it is impossible to create hard standards suitable for all companies, standards have loopholes that might be exploited. However, the border between fraud and earnings management is very thin, and as was revealed by Perols & Lougee (2011), companies that manage earnings are more likely to commit a fraud. That is what makes earnings management a widely discussed topic attracting ever growing attention of academics and practitioners, especially after a series of large corporate scandals in beginning of 2000s.

Globally, research on earnings management started in the 1980s, and to date there have been produced a number of publications on the topic. Researches try to find the ‘best’ model to detect earnings management, study the motives for earnings management, and try determine the

setting in which earnings management is more likely to occur. Another body of research focuses on strategies and instruments of earnings management and factors that influence the choice of these instruments. Though the most controversial part of research is around the influence of earnings management on subsequent company performance and value.

Unfortunately, for emerging markets and particularly for Russia, the topic remains relatively unexplored as compared to the developed countries. There are the two main reasons for that. Firstly, local researches mostly focus on fraud and disregard earnings management as such, since it is not a criminal act and implies no legal consequences. Secondly, investigation of earnings management requires large corporate datasets which started to pile up not so long ago, especially if IFRS data is considered.

One of the aspects of earnings management in Russia that has not yet gained any coverage in academic literature is the association between earnings management and company performance. Moreover, foreign researchers have not yet come to a consensus on how earnings management affects subsequent performance. One group of researchers concluded that earnings management, and particularly real earnings management, is opportunistic and leads to deterioration in subsequent company performance (Cohen & Zarowin, 2010; Legget et al., 2016; Tabassum et al., 2015). In sharp contrast to them, the other group of researchers found a positive relationship, and proposed an informational perspective in line with a signaling theory (Beyer et al., 2018; Gunny, 2010; Chen et al., 2010). As per this theory, managers, who are more informed about the true financial state of the company and company's future prospects, use earnings management to give positive signals to the market when they believe that future results will improve. It implies that managers are well aware of side effects of an earnings management, and will apply it only when they have an understanding of future business growth and have positive news to be signaled to the market. Moreover, earnings management that aims to achieve smoother earnings might help to reduce a cost of debt and trade better terms with suppliers and customers, what in the end may positively influence on performance.

Therefore, **the goal of the thesis** is to investigate the influence of accrual-based and real earnings management on subsequent company performance using the sample of Russian companies.

In order to achieve the research goal and to form a better understanding on the phenomenon of earnings management, a number of research objectives were formulated. The completion of these objectives will not only help to reach the research goal, but can also produce the outcomes

that might contribute to the literature on earnings management in Russia, since a research gap on these issues exists as well.

The first objective is to establish the presence of earnings management and to determine the setting in which companies tend to manage earnings. The incentives for earnings management, be it bonuses to the management or debt covenants, are operationalized into earnings targets that managers should hit. Results of a survey performed by Graham et al. (2005) indicated that managers mainly care about the following metrics: zero earnings benchmarks, last year earnings and analyst's consensus forecasts. A number of researchers, for instance Burgstahler & Dichev (1997) and Kasznik (1999), proved that around the benchmarks, the level of earnings management is at its highest. For Russia, no research has been done to investigate this issue, so the first objective of this research is to study whether local companies inflate earnings to meet the benchmarks and which benchmarks are in the focus of managers.

The second objective is to establish the relationship between real and accrual-based earnings management, and to reveal the factors that influence on the choice between the two strategies. Foreign researchers, for example Zang (2012), identified the following factors:

- the extent of scrutiny by auditors and institutional investors;
- company's financial condition and competitive status in the industry;
- regulatory and tax environment;
- company accounting flexibility.

In the context of Russia, the first to investigate the topic of a choice between real and accrual-based earnings management were Nikulin & Zinchenko (2015), who found that highly levered companies show a propensity to use accrual-based earnings management while real earnings management is used to lesser extent. However, the influence of other factors remains largely uncovered and investigation of this issue is the second research objective of this thesis.

The third objective is to investigate the timing when real and accrual-based earnings management are used. Do companies use them simultaneously or sequentially? If sequentially, which strategy comes first? Does the outcome of one earnings management strategy affect the magnitude of another? Zang (2012) and Cohen & Zarowin (2010) found a direct substitutive relationship between real and accrual-based earnings management. According to their findings, managers use accrual-based earnings management based on the magnitude of unrealized real earnings management. In Russia, research by Nikulin and Zinchenko (2015) revealed similar patterns of earnings management application. However, their research on Russian companies was conducted based on financial reports, prepared in compliance with Russian Accounting Standards

which have a number of deviations from IFRS, around which this research revolves. Therefore, the third objective is to investigate a relationship between the two strategies and the timing in which both strategies are used.

Finally, an answer to main question will be sought - How different earnings management strategies influence on subsequent corporate performance?

To sum up the objectives of this thesis comprise the following:

1. establishing the presence of earnings management and determination of the setting, in which companies tend to manipulate with earnings;
2. discovering the relationship between earnings management strategies (accrual-based vs. real) and defining the factors that influence on choice of either strategy;
3. identification of the timing patterns in which earnings management strategies are used;
4. understanding how either of earnings management strategies affects subsequent corporate performance

This research is focused on public Russian non-financial companies, which publish financial statements prepared under IFRS, and whose shares are traded on Moscow Stock Exchange as well as on foreign exchanges. Data is analyzed over a 10-year period from 2011 to 2020. It was decided to perform the research using IFRS data since investors and other stakeholders primarily rely on IFRS reports. Moreover, results of research based on IFRS data may be compared to the results of research, performed on the datasets from other countries.

This study has both theoretical and practical importance, and its results might be interesting for investors, board members, managers, creditors, policy makers and external auditors. The findings on association between earnings management and earnings benchmarks might be interesting for the investors who rely on IFRS reports. If such an association does exist, a more thorough analysis of financial statements would be called for, whenever earnings are very close to benchmarks. Likewise, boards and auditors might also wish to express more cautions in such cases. The findings on the factors influencing earnings management strategy choice might appeal to various readers of financial statements and auditors as they might give an extra hint that points at the area that requires a closer look. Since operational and economic environment will be considered as factors influencing earnings management, these findings might have implications for policy-makers and show how earnings management reacts to changes in policies. If the substitute relationship between accrual and real earnings management is revealed, it would be an argument for researchers to study both earnings management strategies in combination in order to see a big picture. Currently, most of the research focuses on only one of the strategies. Finally, the

findings on the association between earnings management and performance are important for managers and the boards who are responsible for financial performance and have a control over the extent of earnings management. Generally, the outcomes of all research objectives are interrelated and it would be most beneficial to consider them all in combination.

The rest of the text is organized as follows. The first chapter is devoted to a theoretical review of earnings management and discussion of the current state-of-art in the global research. In the beginning, the concept of earnings management is formulated, and the main motives for earnings management are defined. Next, accrual-based and real earnings management as well as specific techniques of both strategies are introduced with follow-up descriptions of real cases. The examples of Enron Corp. and WorldCom Inc. are undoubtedly the most flamboyant ones, but this text will introduce less famous cases of Cisco Systems, Dell Computer, Microsoft, Oracle, Sunbeam Corporation, and Xerox Corporation. Then, discussion will proceed to restraints for earnings management and factors behind the choice of an earnings management strategy. Theoretical part will be concluded with the discussion of potential influence of earnings management on corporate performance. The epilogue of Chapter 1 is the summary of hypotheses, that were formulated all along the theoretical framework discussion.

The second chapter opens up with the description of data sample and data collection techniques. The econometrical models are then presented, all variables defined and their descriptive statistics provided. Next comes the main part of the paper with presentation and discussion of results as well as their managerial implications. The chapter is closed with limitations and proposals for future research.

CHAPTER 1. THEORETICAL REVIEW OF EARNINGS MANAGEMENT

1.1. Definition of Earnings Management

Back in the late 1980s, in one of the earlier publications on Earnings Management, the definition of the concept was formulated by Schipper (1989) as a “purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain”. The author stressed that Earnings management, in order to be qualified as such, should occur only within the boundaries of accounting standards that inherently provide a certain leeway for the accountants. Very close conceptually, yet more extensive definition was set forth 10 years later in (Healy & Wahlen, 1999) as the use of judgment by managers “to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”. Both of these definitions are widely used in academic literature on earnings management, although the concept has not been yet formulated officially as opposed to fraud.

According to the National Association of Certified Fraud Examiners (1993), fraud is “the intentional, deliberate, misstatement or omission of material facts, or accounting data, which is misleading and, when considered with all the information made available, would cause the reader to change or alter his or her judgment or decision”. As can be seen, the border between earnings management and fraud is very narrow, nevertheless it is traceable. Manipulating accounting figures to the extent that accounting standards are violated is regarded as a fraud and unlawful misrepresentation of financial information. In contrast, altering the figures without breaching the accounting standards can be regarded as “aggressive” or “conservative” accounting (Dechow & Skinner, 2000). For example, recording bogus revenue by falsifying invoices is clearly a fraud, but recognizing revenue too early before goods are shipped on a bill-and-hold arrangement, information about which was disclosed in financial statements, might be referred to earnings management. However, fraud begins where earnings management ends, and as Perols and Lougee (2011) discovered in their paper “The relation between earnings management and financial statement fraud”, companies that manage earnings are more likely to commit a fraud. The reason for this relationship is fairly straightforward: the stronger are the earnings management practices, the stronger is the effect from their reversal. If reversal is not covered by growing business, there appears a need for even greater earnings management which has its limits. Being under rising pressure to meet earnings targets, as will be discussed in the next section, management may decide to cross the red line in hope not to get caught. That is what makes earnings management a widely discussed topic attracting ever growing attention by academics and practitioners.

Having defined the concept of earnings management it is worth to discuss the motives behind the phenomenon.

1.2. Motives for Earnings Management

As revealed by Healy (1985), top-management bonus schemes based on earnings targets create very strong incentives to manipulate earnings. In his research, companies, where bonus schemes did not have an upper-bound, had far higher accruals as compared to companies with binding bonus plan. Holthausen et al. (1995) extended Healy's research (1985) and proved that earnings are managed downwards if bonuses have already reached the maximum level. Later research by Bergstresser and Philippon (2006) showed that earnings management is more pronounced at companies, where top-management's compensation is closely tied to the company's stock price, for example via stock options. Moreover, they noticed that at periods of abnormally high accruals, there was a remarkable rise in stock options exercises and sale of shares by CEOs. In its turn, it induces suspicions on insider trading and deliberate earnings manipulations for the sake of private gains.

Besides monetary incentives, managers are also driven by non-monetary incentives such as career concerns (Graham et al., 2005). Managers try build external reputation, and downfall in a company performance is short handedly associated with management of a company. If a company does not hit the earnings target, managers might be accused of incompetency, so that their inter-company mobility and career prospects might severely diminish. In the worst case their employment contract might be terminated (Graham et al., 2005).

The next reason to interfere with normal accounting process is the necessity to meet debt covenants as was discussed by DeFond and Jiambalvo (1994), who found abnormally high accruals in the companies' financial statements one year prior to the violation of debt covenants. Meeting covenants becomes an acute issue after the financing had been disbursed. However, according to Goncharov and Zimmermann (2007) companies are also engaged in earnings management in order to attract financing. Another reason is to ensure lower cost of financing (Dechow et al., 1996).

The next incentive for earnings management is related with the stock market and managers' desire to boost stock price prior to the stock issuance. Teoh et al. (1998) discussed the tendency of net income and accruals to rise before stock offering, peaking in the year of offering and falling after the stock issuance. Russian stock market is not an exception, and evidence of earnings management around IPO was found by Nikulin and Sviridov (2019). Despite stock price maximization around stock issuance is of high importance for the managers, avoiding stock price

declines is of not lesser concern. As was discovered by Barth et al. (1999), market rewards companies that demonstrate patterns of increasing earnings via higher price-earnings multiples, and punishes the companies for breaking the pattern, what inadvertently creates incentives to manipulate earnings.

Besides the need to sustain a streak of constantly growing income, companies try to meet analysts' consensus forecasts, which are closely monitored by investment community. If a company misses the consensus forecast, the stock price usually falls. Kasznik (1999) in his research demonstrated that upward-earnings management is utilized when companies are about to miss analysts' forecasts. Even stronger positive association between earnings management and need to meet forecasts was revealed given a high number of analysts and high cost of litigation. Litigation might occur if a company is accused of providing overly positive, yet unrealistic earnings guidance that had moved the stock price upwards at the time of forecast publication.

Taxation might be another motive to induce companies into earnings management if financial and tax accounting systems are closely interrelated (Herrmann & Inoue, 1996). In order to optimize income tax, companies try to avoid large fluctuations of earnings, since a higher income would result in higher taxes, while a lower income, though leading to lower taxes, may invoke undesirable tax investigations.

Though financial companies are not in the focus of this research, it is worth to mention that commercial banks have another strong incentive to manipulate earnings, an incentive stemming from the regulatory oversight by the central banks. Commercial banks need to meet capital adequacy requirements, and in case of their breach, a regulator may intervene and impose such measures as a suspension of dividend payments, issuing request to dispose of assets and even dismissal of management (Beatty et al., 1995). This stimulus to manage earnings concerns not only banks but also other financial companies, for instance, insurance companies.

To sum up, companies may manipulate earnings to:

- ensure higher compensation and brighter career perspectives for the management;
- attract external financing at favorable rates and to meet debt covenants;
- inflate stock prices, particularly during stock issuance;
- optimize taxes;
- meet regulatory requirements.

The breeding ground for the aforementioned stimuli is a principal - agency conflict, arising due to separation of ownership and management roles (Jensen & Meckling, 1976). Relationship between shareholders and management is a type of principal-agent relationship, in which shareholders (the principal) hire management (the agent) to perform some service on their behalf, particularly to run a company. Considering that both parties are utility maximisers and have their own interests, agents do not always act to the best interests of their principal. Provided that there is a natural information asymmetry between management and shareholders, a more informed management may alter earnings to reach a particular goal.

The discussed incentives for earnings management are operationalized into earnings targets that managers should hit, and if a target is about to be missed, earnings management comes into play.

Results of a survey performed by Graham et al. (2005) indicated that managers mainly care about the following four benchmarks: same quarter last year earnings, analyst's consensus forecast, zero earnings benchmark, and previous quarter earnings. Almost a decade preceding that survey, Burgstahler and Dichev (1997) found it very suspicious that distribution of earnings and earnings changes have a sharp discontinuity around zero point. In other words, there was significantly larger number of small positive values than small negative ones. In the result of their investigation, they found that 8% to 12% of firms facing an earnings decrease apply earnings management to report an earnings increase. Likewise, 30% to 44% of firms with slightly negative pre-managed earnings try to report positive earnings. Besides, Kasznik (1999) and Burgstahler and Eames (2006) proved that managers use earnings manipulation to hit management and analysts forecast if forecasts would have been missed otherwise. Roychowdhury (2006) in his distinguished work on real earnings management proved that companies resort to real earnings management in order to meet a zero earnings target and achieve positive forecast deviations.

In context of Russia, no research has been done to investigate the association between earnings management and earnings benchmarks. However, it is interesting to see whether local companies inflate earnings to meet benchmarks and which benchmarks are in the focus of managers. Hence, the first hypothesis, based on the above mention research papers, is formulated as follows:

H1.1.: “Firms that just meet zero earnings benchmark (earnings are in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”

H1.2.: “Firms that just meet last year's earnings benchmark (year-on-year change in earnings is in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”

A company is considered to just meet zero earnings benchmark if its net income after taxes scaled by lagged total assets is in the range between 0 and 0.01. Likewise, a company is considered to just meet last year earnings benchmark if the year-on-year change in its net income scaled by lagged total assets is in the range between 0 and 0.01. The threshold of 0.01 was determined based on other research papers as well as analysis of the data sample. More detailed justification of the 0.01 threshold is provided in the discussion of methodology in section 2.1.2.

Since consistent data on analysts forecast is hard to collect, earnings management to meet analysts forecast is out of scope of this work and will rest with future research.

Besides, statistically significant association between earnings management and earnings benchmarks would serve as an additional proof to the phenomenon of earnings management and verify the adequacy of models that are used to estimate the earnings management proxies.

Having discussed the reasons and motives for earnings management, it is interesting to elaborate on strategies and methods to manipulate earnings.

1.3. Strategies of Earnings Management

Academics generally divide earnings management into two broad categories: Accrual-based earnings management and Real earnings management, for example in Cohen et al. (2008), Chen et al. (2010), Nikulin and Zinchenko (2015), Zang (2012), to name a few. Primary difference between the two strategies is the influence on company operations and cash flows.

Accrual-based earnings management does not affect the operational activities and revolves around manipulating accounting procedures. The possibility to use accrual-based earnings management is provided by accounting standards themselves. According to IAS 1, “an entity prepares its financial statements, except for cash flow information, using the accrual basis of accounting” (IAS 1 — Presentation of Financial Statements, n.d.). This is known as accrual principle of accounting, and it is the foundation of all accounting frameworks such as US GAAP or IFRS. According to the accrual principle, revenues and expenses are recorded when they actually occur, regardless of the cashflows related with those operations, what requires the implementation of accounting policies and estimates. And here comes the moment when company management needs to use their professional judgement. Being under pressure to show certain performance indicators, the judgement may become biased, while accounting figures may become distorted and do not mirror true economics of a company (Healy & Wahlen, 1999).

In contrast to accrual-based earnings management, real earnings management presumes the interference with normal business practices and carrying out certain operations for the sake of

earnings correction (Roychowdhury, 2006). Real earnings management does alter the cashflows, however it does not lead to abnormal accruals, what makes it much harder to detect. In 2005, Graham et al. (2005) published the results of large investigation in which they surveyed more than 400 finance executives at American companies on the issues of financial reporting and disclosure. Majority of CFOs confessed that they would rather perform real earnings management rather than accrual-based in a fear of retribution from regulators. Despite being so widely used, real earnings management has long been in the shadow of accrual-based earnings management in academic society which began to investigate the topic of real earnings management only in 2000s (Roychowdhury, 2006).

1.4. Methods and techniques of Earnings Management

To better illustrate accrual-based and real earnings management, there was created a list of the most popular earnings management techniques with follow-up commentary, split into two groups accordingly, based on (Schilt & Perler, 2010; Toumeh & Yahya, 2019; The Association of Accountants and Financial Professionals in Business, 2018).

1.4.1. Accrual-based earnings management techniques

- *too early recognition of revenues*
 - according to IFRS 15, revenue is recognized when performance obligations are satisfied, or in other words when customers obtain control over goods / services. Performance obligations can be satisfied at a point in time or over time (long-term contracts), but in this case a company should select appropriate progress measure, such as a percentage-of-completion in construction industries. Such long-term contracts are particularly susceptible to earnings management since companies might aggressively recognize revenues that are supposed to be recognized in subsequent fiscal periods;
 - revenue on short-term contracts may also be manipulated by being recorded before the shipment using so called bill-and-hold arrangements. This sort of arrangement means that a buyer does not take goods delivery and “asks” a seller to store the goods due to insufficient storage space. Since payment is due at some later date, a mere agreement between the parties and paperwork are sufficient to record a revenue transaction;
 - sales via intermediaries such as consignees and distributors are also subject to manipulations, since GAAP allows two models of revenue recognition, namely “sell-in” and “sell-through”. Under “sell-in” approach revenue is recognized when the goods are sold to reseller, while “sell-through” presumes revenue recognition when goods are sold by reseller to end-user. Obviously, “sell-through” is a more conservative approach, yet the choice of methods rests with the company;

- very often buyers are granted a right of return, and sellers are supposed to recognize expected returns until the right of return lapses. Manipulation with expected returns estimates is also revenue related earnings management, since provisions for expected returns are contra-revenue accounts that directly influence on profit and loss statement;
- ***too late recognition of expenses and inappropriate capitalization of expenses***
 - expenses are recognized upon receipt of invoice or upon validating an acceptance act, denoting that the goods or services have been duly received. If necessary, a company may defer the recognition of expenses until the later period by not accepting an invoice or by renegotiating the date of invoice. In this case, expenses will reside with balance sheet as prepaid expenses;
 - companies may wrongly capitalize the normal operational expenditures that produce short-term benefits, for example marketing costs and early-stage research and development expenses. In contrast, later-stage research and development expenses, when project shows “feasibility”, should legally be capitalized;
 - all accounting frameworks require companies to conduct impairment tests to verify whether a fair value of any of the company assets is below its book value. Manipulating the size of and postponement of impairment charges is a popular earnings management tool that attracts special attention of external auditors;
- ***manipulation with accounting estimates***
 - fixed assets need to be depreciated, intangible assets need to be amortized, while natural resources need to be depleted over the useful life of an asset. Calculation of depreciation requires three parameters: length of the useful life, salvage value and the depreciation method, which are all subject to management discretion what opens wide opportunities for earnings management, especially at capital intensive companies;
 - companies need to create allowances for doubtful accounts to take into account that not all customers will pay on time and in full. Besides, companies may purchase financial assets which might further diminish in value, what requires recognition of provisions. Provisions are recognized based on management estimates of expected losses creating a room for earnings management. For financial institutions, whose balance sheet almost entirely consists of financial assets and liabilities, manipulation with provisions is usually enough to cover the whole of earnings management needs;
- ***adoption of new accounting standards***
 - accounting standards constantly evolve in response to changing business environment. Usually, it takes several years for a new standard to become compulsory from the day of its publication. For example, previously mentioned IFRS 15 was issued in May 2014

with the effective date for annual reporting beginning on 1 January 2018. However, standard setters allow early application of new standards subject to discretion by a company management who may decide to apply or not to apply the update depending on their earnings goals;

- ***classification of assets based on effect on earnings***
 - depending on classification of financial assets, change in their fair value will be recognized in profit and loss statement, as other comprehensive income, or not recognized at all. Even though the standards, previously IAS 39, and now IFRS 9, stipulate the rules for recognition and reclassification, company still have a certain discretion;
 - there are three options to classify investment in other companies depending on the degree of influence over those companies. If there is no influence or control, investment is classified on the balance sheet as any other security in compliance with IFRS9; if there is a significance influence, equity method (IAS28) is used; and if there is a control, the owner fully merges financial statements of subsidiaries into its own ones according to IFRS10. Depending on the financial performance of investee, it is possible to use grey zones of accounting standards and to reclassify an investment without violation of rules, for example to refuse consolidation of a company with weak performance.
- ***net income vs. operating income***
 - investors, analysts and other stakeholders pay attention not only to net income, but also to operating income. It is possible that a company may be forgiven by the market if net income appeared to be below expectations because of one-time nonrecurring expenses, provided that operating profit is adequate and up to expectations. Though net income remains unchanged, companies try to shift regular expenses below-the-line to non-operating section, and vice versa, show non-operating income as part of regular operations.

The peculiarity of accrual-based earnings management is its flexibility. The abovementioned methods work well in both directions and may help not only to increase earnings but also to decrease them, and even preserve some for the future.

In a good year, companies might create so called “Cookie jar reserves” meaning that companies become overly conservative and recognize expenses that may be reversed later. For instance, it is possible to overstate sales returns, defer revenue, over create provisions for doubtful accounts or to overestimate restructuring charges (Schilt & Perler, 2010; Toumeh & Yahya, 2019).

In a bad year, if company's indicators lag far behind the benchmarks, companies' accounts may take a "Big bath". During a "Big bath" companies massively write down impaired assets, create provisions that ought to be created, and try to recognize various expenses upfront in order to build a strong foundation for high profits in future periods. "Big bath" strategy is often used at times of economic crises, when company's failures can be associated with global events or during management turnover (Schilt & Perler, 2010; Toumeh & Yahya, 2019).

Income decreasing earnings management may occur not only within "Cookie jar reserves or "Big bath" practices, but also as a standalone strategy to present a company as a weak entity in order to receive government subsidies (Zhao et al., 2019). However, such practices are not often met and mostly used in companies with inadequate management compensation schemes.

1.4.2. Real earnings management techniques

The pioneer of empirical research on real earnings management is Roychowdhury (2006) who specified the following methods for real earnings management and proposed models for their detection:

- ***sales manipulation***
 - sales can be temporarily increased if customers are offered price discounts or lenient credit terms. This method is utilized closer to the fiscal year end. Besides discounts, companies may initiate massive marketing campaigns with the objective of short-term sales boost (Roychowdhury, 2006);
 - offering discounts and lenient credit terms are usually accompanied by "Channel stuffing", a strategy when companies unload goods to their distributors in much larger quantities than they are able to resell. In this case, distributors will either return unsold goods or continue to sell them in next periods (Schilt & Perler, 2010);

The downside of manipulations with sales is an additional pressure on next reporting period sales and potential rise in provisions for doubtful accounts following the ease of credit terms.

- ***reduction of discretionary expenditures***
 - companies may reduce or postpone discretionary expenditures such as marketing, R&D (research and development) and SG&A (selling, general and administrative) expenses that do not have a direct effect on business in the current accounting period. These expenses might include such items as maintenance expenses, employee trainings, business travel and etc. Even though reduction of discretionary expenditures may effectively increase short-term earnings, the consequences may be felt in future when

company ends up with outdated products due to lack of R&D or bears high equipment repair charges due to poor maintenance (Roychowdhury, 2006);

- ***overproduction***

- conceptually, cost of goods sold (COGS) at manufacturing companies are calculated by deriving the cost of a single unit of a product and then multiplying it by the number of units sold. Since total costs include both variable and fixed costs, producing a higher quantity of goods leads to the reduction in costs per 1 unit since fixed costs are spread over a larger number of goods produced. Consequently, COGS may go down, unless there is an increase in marginal costs that will wipe out the fixed costs effect. Also, producing goods in excess of demand, raises the issue of goods storage and increased holding costs (Roychowdhury, 2006).

In addition to techniques investigated by Roychowdhury (2006), real earnings management is possible to realize via a sale of fixed assets and marketable securities (Herrmann et al., 2003; Bartov, 1993).

- ***sale of fixed assets and marketable securities***

- according to IAS 16, fixed assets are recognized using either the cost model (historical costs less accumulated depreciation and impairment) or the revaluation model, when assets are revalued at fair value at each reporting date (IAS 16 — Property, Plant and Equipment, n.d.). Cost model does not imply any gains from an increase in the market value of assets. If revaluation model is used, a company should recognize revaluation gains, but as a part of other comprehensive income with no effect on earnings. However, when assets are sold, any unrealized or not recognized gains become a part of net income. Thus, earnings can be managed by voluntarily sale of assets to recognize gains on sale. Similar logic concerns the sale of securities which are recognized at amortized costs or at fair value through other comprehensive income. Any unrealized gains can turn into earnings upon derecognition of securities in the case of their sale. The application of such an earnings management technique was mentioned by CFOs who participated in the survey by Graham et al. (2005) and was empirically proved in research by Bartov (1993) and Herrmann et al. (2003).

Both accrual and real earnings management are often used for earnings smoothing, a long-term earnings management strategy aimed at reduction of earnings volatility. More stable earnings are perceived by investors as less risky, and would allow companies to attract funds at lower rates and also to trade better terms with customers and suppliers (Graham et al. 2005, Barth et al., 1999).

1.5. Real world cases of Earnings Management application

Earnings management methods illustrated above are discussed not only in academic literature, but reference thereto can also be found in enforcement reports of SEC (U.S. Securities and Exchange Commission) or regulators alike, when companies go too far with such practices, or even in mass media, when illegal earnings management turns into big corporate scandals (Schilt & Perler, 2010).

The most popular corporate scandals are undoubtedly related to Enron Corp. and WorldCom Inc. which served as a trigger for enactment of Sarbanes-Oxley Act in 2002, that aimed at restoration of investors' confidence in financial markets (Schilt & Perler, 2010). There were also many other less famous stories, though related with rather famous companies such as: AIG, Cisco Systems, Computer Associates, Dell Computer, IBM, Krispy Kreme Doughnuts, Microsoft, Oracle, Sunbeam Corporation, Toys 'R' Us or Xerox Corporation.

For example, Xerox increased residual value on leased equipment to reduce depreciation charges and this way overstated operating earnings by \$43 million from 1997 to 2000 (Securities and Exchange Commission v. Xerox Corporation, 2002).

Manipulating with warranty obligations is another way of manipulation with accounting estimates that was practiced by Dell and was revealed in 2007. Its own audit committee reported that Dell's management manipulated with product warranty liabilities and related expenses. Upon results of internal investigation, financial statements for four years were restated (Lawton, 2007).

In 1990s Microsoft sales were soaring, and it decided to create "Cookie jar reserves" via unearned revenue that accounted for "future software upgrades". In the 4th quarter 1999, Microsoft changed its revenue recognition policy, and started to recognize more revenues right away, freeing up accumulated reserves (Schilt & Perler, 2010). Internet boom in late 1990s and beginning of 2000s pleased another technology giant, namely Cisco Systems. In April 2001 it wrote-down good inventory in the amount of \$2,5 billion, which is equal to its one quarter COGS. In subsequent periods, Cisco recycled previously written-off inventory and inflated profit margins by selling inventory, whose cost was reduced beforehand (Hilzenrath, 2001).

The next example described in Schilt and Perler (2010) illustrates the case of accrual-based earnings management using misclassification of assets. Oracle Corporation, an American multinational computer technology company, had a business division that it decided to spin off into a separate affiliated company in late 1990s and named it as Liberate. After the IPO, Oracle still retained 32% stake in Liberate and had a significant influence over the company. Accordingly, Oracle had to use an equity method of accounting, and to recognize Liberate's earnings in its

financial statements on the basis of a pro rata ownership. In January 2001, observing that Liberate had suffered losses, Oracle placed all its Liberate shares into a trust in such a way as to forfeit its voting rights. In terms of economics, nothing changed for Oracle, however it claimed that significant influence over investee was lost, and the equity method was no longer applicable. Thus, Oracle started to recognize the investment as “available-for-sale” security with no effect of Liberate’s performance on Oracle’s financial statements. In 2004 Liberate went bankrupt and Oracle had to record impairment charges, but only in 2004, while the results for 2002 and 2003 were not affected by ever growing Liberate’s losses.

The concluding example, that needs be discussed, is a case of Sunbeam Corporation, an American manufacturer of home appliances. Material is taken from SEC Order (Securities and Exchange Commission, 2001)

In early 1990s Sunbeam struggled with financial problems, and in July 1996 it hired a new management to perform company reorganization. In course of reorganization, company performance did significantly improve, and stock price soared from \$12 in July 1996 to a peak of \$52 in March 1998. Later, in June 1998, it became known that striking improvements in financial results were nothing but a massive earnings management and fraud. Company’s financial statements were restated, stock price plunged to \$7 and the company was reorganized.

Sunbeam’s management used multiple earnings management schemes described above. Firstly, at the time of restructuring, it created “cookie jar reserves” via restructuring charges, prematurely recognized expenses and excessive writes-down of inventory, in order to show a nicer picture in subsequent quarters. Sunbeam then applied “Channel stuffing” and “Bill-and-hold” sales, when in March 1997 it sold goods to resellers with a right of return. All storage, transportation and insurance costs were covered by Sunbeam. Similar practices continued in subsequent quarters. Moreover, to induce customers into such sales, Sunbeam offered price discounts and lucrative payment terms.

In the beginning of 1998, it became clear to Sunbeam’s management that all earnings management reserves were nearly exhausted, reversals had started, and it decided to extend its quarter end date from March 29 to March 31 to book additional sales. Also, Sunbeam negotiated acquisition of three other companies to conceal problems in another restructuring charge. Nevertheless, results started to deteriorate, and investors and public started to have suspicions. In June 1998, an article about accounting irregularities had appeared in press, after which the Board initiated investigation and dismissed CEO and CFO. In November 1998, company issued restated financial statements for a period starting in 4th quarter 1996, in which income was just a half of

reported previously. Investors were very disappointed, stock price plunged and company started reorganization under Chapter 11 of the U.S. Bankruptcy Code.

1.6. Restraints of Earnings Management

As was stated above, the root of an earnings management phenomenon is an agency problem. Hence, measures aimed at minimization of a principal-agent conflict should also effectively combat earnings management. One of the most useful instrument to ensure that managers act in the best interest of shareholders is a corporate governance (Daily et al., 2003). The influence of corporate governance mechanisms on earnings management has long been in the focus of researchers (Mangala & Isha, 2017). In 1996, Dechow et al. (1996) found a systematic association between earnings management and weaknesses in corporate governance. For example, it was proved that opportunistic earnings management was more likely to occur at companies with no audit committee, where the board has no or few external directors, and where CEO is also the board chairman.

Generally, such corporate governance aspects as board, audit committee, ownership structure and external auditors have long been in the focus of research on the association between corporate governance and earnings management (Mangala & Isha, 2017).

Board of directors is the highest governing body in any public company, appointed by shareholders to protect their interests, to conduct company oversight and to make key strategic decisions. As many research works confirmed, board oversight is a powerful constraining factor for earnings management, and board characteristics that of particular importance are: independency of board members, board size, board activity, busyness of directors and CEO duality (Mangala & Isha, 2017). In the context of Russia, Nikulin et al. (2020) revealed that the board size and the share of independent directors are inversely associated with earnings management.

If a board is responsible for overall company oversight, audit committee is specifically responsible for financial reporting and disclosure. Being a link between the board, internal and external auditors, the audit committee monitors business processes and ensures the credibility of financial statements (Mangala & Isha, 2017). The audit committee characteristics that attract attention of researchers are: a mere existence of audit committee, independence and financial expertise of its members, frequency of meetings, and quality of external auditor.

Just a presence of an audit committee was proved to reduce earnings management. However, if audit committee comprises independent directors with financial expertise, the quality of reporting becomes much higher. Quality of external audit also plays a crucial role, and companies audited by “Big N” audit companies show more reliable accounting figures as

compared to companies audited by less reputable firms (Mangala & Isha, 2017). As was revealed by Nikulin et al. (2020), in Russia, as in other countries, presence of audit committee, independence and financial expertise of its members, and higher involvement in oversight, positively affect earnings quality.

Another important corporate governance issue proved to influence earnings management is the ownership structure. Three aspects are particularly important to consider: managerial ownership, ownership concentration and institutional ownership (Mangala & Isha, 2017). Large shareholders and institutional shareholders have a right and ability to perform monitoring function what leads to a reduction in earnings management.

The mentioned corporate governance characteristics are undoubtedly a restraining force for earnings management, however a company should also have the adequate executive compensation plan that does not revolve around a mere profit maximization (Bergstresser & Philippon, 2006; Daily et al., 2003).

1.7. Choice of an Earnings Management strategy and factors behind the choice

Managers, when in need to boost earnings, may choose between the two earnings management strategies: accrual-based and real earnings management. Next, it is interesting to find out: which strategy is more preferred? what factors affect the choice of either strategy? are they used simultaneously or sequentially? if sequentially, then in each order?

Based on the revelations of executives of American companies who were surveyed by Graham et al. (2005), it was found that managers generally give preference to real over accrual-based earnings management even if it entails a sacrifice of value, for example due to delaying R&D expenditures or sacrificing positive NPV projects. Such an inclination towards real earnings management is mainly driven by the operating environment that appeared in USA after the enactment of Sarbanes–Oxley Act in 2002. The act made CEOs and CFOs personally liable for any misrepresentations in financial reports with liability being as fierce as imprisonment.

Empirical evidence of a propensity for real earnings management after tightening of regulations was found by Cohen et al. (2008) and was described in their article “Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods”. They found that accrual-based earnings management was increasing until the passage of SOX, and fell sharply after the act had been imposed. At the same time, the inverse tendency was observed for real earnings management, what demonstrated that managers generally switched from accrual to real earnings management.

Survey similar to the one by Graham et al. (2005) was performed in Russia by Leevik (2017) in which 137 managers from large Russian companies gave responses on their attitude towards various methods of earnings management. Generally, accrual-based methods were judged stricter as compared to real earnings management.

Despite the preference of real earnings management, managers may still choose either earnings management strategy or both. Zang (2012) investigated the issue of the choice of an earnings management strategy via the prism of the relative costliness of both methods, which is determined by both systematic and company-specific factors. Both strategies imply costs and constraints, and managers tend to use the method, that is less costly and more available.

According to (Zang, 2012) the choice of an earnings management strategy is affected by:

- fierceness of scrutiny by auditors, regulators and institutional investors;
- company accounting flexibility;
- company's financial condition and its competitive status in the industry;
- tax environment.

The first factor, revealed by Zang (2012), that affects the choice of an earnings management strategy is the degree of scrutiny by auditors and regulators. Companies, audited by BigN audit firms and / or by the same auditor without rotation for a long time, showed lower levels of accrual-based earnings management. BigN companies appraise their reputation and have greater competencies as compared to second tier audit firms. Similarly, the longer the audit tenure of one auditor firm, the better an auditor becomes familiar with accounting of a company, what helps to avoid audit errors and not to miss earnings management. Therefore, the first hypothesis on the factors affecting earnings management strategy choice is formulated as follows:

H 2.1: “Other things being equal, firms facing greater scrutiny from auditors have a higher level of Real earnings management and a lower level of Accrual-based earnings management”

Accounting flexibility is another important factor to determine the choice of an earnings management strategy (Zang, 2012). Due to a feature of accruals reversal, companies, that have used accrual-based earnings management in previous accounting periods, have less opportunities to do so in the next periods. Likewise, companies with shorter operating cycles have naturally lower accrual accounts which reverse faster, and thus constrain accrual-based earnings management. Zang (2012) proved that companies with shorter operating cycles and with inflated

net operating assets prefer real over accrual-based earnings management. Following the findings of Zang (2012) the next hypothesis is stated as:

H 2.2: “Other things being equal, firms with higher accounting flexibility have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

The third to influence on the choice of a strategy is company’s financial health. If a company enjoys a large market share and remains financially healthy, managers might feel themselves more flexible to deviate from normal business practices and turn to real earnings management (Zang, 2012). On the other hand, CFOs interviewed by Graham et al. (2005) acknowledged that if a firm grows, there is a higher chance that accrual reversals will be offset by future earnings. And vice versa, if a financial condition of a company is poor, small earnings management decisions may snowball and lead to unbearable problems. Hence, it is possible that the opposite relationship between earnings management and financial health prevails, i.e., if a company is in trouble, managers would rather reduce real expenditures rather than postpone them, knowing that reversal will not be covered by future profits. Moreover, real earnings management is a technically more complicated strategy that might have negative implications for future performance. Hence, it is expected that managers will not revert to this technique unless there is a strong necessity to do so, and therefore the next hypothesis is set forth as:

H 2.3: “Other things being equal, firms with a better financial health have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

If auditors and regulators perform external monitoring, the board and shareholders monitor internally and push managers to make value-maximizing financial decisions. Institutional investors perform better monitoring function and are more informed of internal business processes as compared to retail investors. Zang (2012) proved that companies with a larger share of institutional shareholders practice real earnings management to lesser extent and are more involved in accrual-based earnings management. The possible explanation is that real earnings management, for example postponement of investment projects, has negative implications for a company value. Institutional investors effectively combat such practices to protect their interests. The discussion gave rise to the following hypothesis:

H 2.4: “Other things being equal, firms with higher institutional ownership have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

Tax incentives were also found to influence earnings management strategy selection (Zang, 2012). Real earnings management affects not only cash flows but also taxable income, while many

accrual-based earnings management methods do not alter the tax base, at least as per the US tax legislation. Therefore, for companies with higher marginal tax rates there was found a positive association between tax rate and accrual-based earnings management, and negative one with real earnings management. The results obtained by Zang (2012) go in line with earlier research performed by Cohen and Zarowin (2010) who proved that presence of BigN auditor, longer audit tenure and higher net operating assets are positively associated with real earnings management.

In USA, corporate governance practices underwent radical reforms in 2002 with the enactment of Sarbanes-Oxley Act, which led to a drastic fall in accrual-based earnings management, and its substitution for real earnings management. In Russia, similar yet less stringent reforms occurred in 2014 when the Central Bank of Russia approved and recommended the Corporate Governance Code to be followed by public companies (The Central Bank of Russia, 2014). Since the acceptance of the Code, corporate governance practices at Russian companies have been improving and the number of companies following the Code principles has been gradually rising (The Central Bank of Russia, 2021). As corporate governance is one of the most effective instrument against earnings management, it is reasonable to hypothesize that Code acceptance played its role to improve the transparency and quality of financial reporting, and induced companies to reduce accrual-based earnings management that is a priori easier to detect. Hence, the next hypothesis is formulated as follows:

H 2.5: “Other things being equal, acceptance of Corporate Governance Code in Russia in 2014 led to a higher usage of Real earnings management and a lower usage of Accrual-based earnings management”

Cohen et al. (2008) in their analysis of real and accrual-based earnings management in the pre- and post- SOX periods considered overall economic activity as a factor to influence earnings management. Economic activity was not in the focus of their research, and was rather used as a control variable. However, in this research, it is feasible to study the association between earnings management and stage of economic cycle. When economy is booming and a company may expect the rise in financial indicators, it may revert to accrual-based earnings management expecting that accruals reversal will be offset by rising earnings. Likewise, rejecting investment projects, reducing R&D or offering discounts, looks like a suboptimal strategy to manipulate earnings, provided that economy is growing and company needs to maintain its business growth. Therefore, the next hypothesis is put forwards as follows:

H 2.6: “Other things being equal, when economic conditions are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management.”

In context of Russia, the first to investigate the topic of a choice between real and accrual-based earnings management were Nikulin and Zinchenko (2015), who found that highly levered companies show a propensity to use accrual-based earnings management rather than real earnings management. The reason for such a relationship is that companies with high debt burden are more thoroughly monitored by their creditors who limit the opportunities for real earnings management. Since this issue have already been investigated in the Russian setting, the factor of leverage will not be explicitly tested, but will be accounted for as a control variable.

To summarize, the following factors of an earnings management strategy choice will be studied:

- scrutiny from auditors;
- institutional ownership (monitoring by shareholders);
- accounting flexibility;
- company financial health;
- economic conditions;
- acceptance of Corporate Governance Code in Russia in 2014.

1.8. Timing of Real and Accrual-based earnings management

The next issue to consider is the timing when real and accrual-based earnings management are used. Do companies use them simultaneously or sequentially? If sequentially, which strategy comes first? Does the outcome of one earnings management strategy affect the magnitude of another?

The peculiarity of real earnings management is that it must be used by the fiscal year end, while accrual-based earnings management may be applied as within the year and after the year end. For example, in Russia, companies are given 120 days to submit IFRS reports after the year end (The Federal Law on Consolidated Financial Statements [In Russian], 2010). Such a long reporting period is stipulated by the necessity to form expert judgement to record revenues and expenses. For example, calculation of provisions for doubtful accounts in compliance with IFRS 9 requires estimation of certain metrics that involve rather sophisticated calculations such as probability of default or loss given default.

Hence, it is possible that managers first apply real earnings management, and then calibrate the financial results with accrual-based earnings management. Alternatively, managers may decide at a single point of time in what way both strategies will be applied. In this case, the outcome of either strategy does not influence the other.

This issue was extensively studied by Zang (2012), who found “a direct substitutive relation between real activities manipulation and accrual-based earnings management”. As her research showed, managers use accrual-based earnings management looking at the magnitude of unrealized real earnings management. Consistent with (Zang, 2012), Cohen and Zarowin (2010) detected that firms utilize both earnings management strategies and they substitute between the two methods. In Russia, research by Nikulin and Zinchenko (2015) revealed similar patterns. As in other countries, managers in Russia first use real earnings management, and then calibrate the result with accrual-based earnings management. However, their research on Russian companies was conducted based on financial reports, prepared in compliance with Russian Accounting Standards which have a number of deviations from IFRS. It opens a room for further investigation, and allows to formulate the next hypothesis as follows:

H3: “Real earnings management and Accrual-based earnings management are used sequentially; managers adjust the amount of Accrual-based earnings management depending on the outcome of Real earnings management”

1.9. Influence of Earnings Management on company performance

The last concept to consider is the influence of earnings management on subsequent company performance and profitability. This particular topic remains in the focus of many researchers, who have not yet come to a consensus on how earnings management affects future performance.

In theory, since real earnings management entails interference into business operations, it should have implications for subsequent company performance. As was discovered by Graham et al. (2005), managers are ready to give up positive NPV projects if this action helps to boost short-term earnings. It implies that real earnings management should negatively affect subsequent performance. On the other hand, accrual-based earnings management is purely an accounting action, and it thus should have no effect on performance. Consistent with this assumption, Cohen and Zarowin (2010) showed that earnings manipulation around seasoned equity offerings (SEO) using real earnings management caused more severe decline in post-SEO company performance as compared to manipulation with accruals. Legget et al. (2016) investigated the relationship between real earnings management and performance conditional on the benchmarks that companies tried to beat. They found that companies using real earnings management to avoid a loss do worse than companies that did not use real earnings management and reported a loss. However, the effect of real earnings management on performance is less prominent when companies tried to meet analyst forecasts, what suggests that managers take more drastic actions

when they try to avoid a loss. Tabassum et al. (2015) on the sample of Iranian companies also found a strong negative association between real earnings management through sales manipulation and subsequent company performance.

Earnings management that was discussed to this point can be referred to opportunistic earnings management, that is realized for the sake of private gains at the expense of other stakeholders. However, there is an opposing theory which states that earnings management can be “good” and can be performed for informational purposes (Wardani & Kusuma, 2012). According to the informational perspective on earnings management, managers, who are more informed about the true financial condition of the company and company’s future prospects, use earnings management to give positive signals to the market when they believe that future results will improve. Proponents of this theory believe that managers are well aware of side effects of an earnings management, and will apply it only when they have an understanding that future business growth will cover any reversals (Wardani & Kusuma, 2012). In compliance with this theory, there should be a positive relationship between earnings management and profitability, exactly what was found by Beyer et al. (2018), Gunny (2010), and Chen et al. (2010). Moreover, one of the motives of earnings management is to achieve smoother earnings. Smoother earnings may help to reduce cost of debt and to trade better terms with suppliers and customers (Dechow et al., 1996). In this case, earnings management might have positive cause-and-effect relationship with performance. However, it is worth to say that positive effects will be observed until earnings management is revealed by the market, after which company risk premium might significantly increase (Dechow et al., 1996).

In support of informational perspective of earnings management, Gunny (2010) found that companies engaging in real earnings management had a better subsequent industry-adjusted performance as compared to firms that restrained from earnings management. Beyer et al. (2018) dived deeper into the informational perspective of earnings management, and found that companies use earnings management for signaling purposes when they have few incentives to meet short-term benchmarks, operate in less robust environments (e.g., high stock market volatility and few analysts following), and for which engaging in real earnings management is more costly (e.g., with poor financial health). Chen et al. (2010) compared the response of operating performance indicators to both real and accrual-based earnings management. According to their findings, profitable companies that used only real earnings management outperformed profitable firms that primarily engaged in accrual-based earnings management. These findings advocate that real earnings management is used only by the companies that have positive news to be signaled to the market.

As can be seen from the above discussion, academic society has not yet formed a single opinion on the relationship between earnings management and subsequent performance, as regarding the earnings management in general and also regarding the relative influence of real and accrual-based earnings management. In such circumstances, it is feasible to further investigate the issue, especially considering the fact that there exists no evidence from Russia.

In Russia, provided that operational environment and disclosure requirements are relatively soft compared to developed markets, and given the relatively young corporate governance practices, it is more probable that earnings management go in line with opportunistic behavior rather than with informational. Hence, it is more likely that the relationship between earnings management and performance is negative. As for the relative influence of real and accrual-based earnings management on performance, it is hypothesized that real earnings management should have negative consequences while accrual-based earnings management might have little or no effect due to its accounting nature. The final hypothesis is formulated as follows:

H4: “Real earnings management is detrimental to subsequent company performance and its influence is more adverse as compared to effect of Accrual-based earnings management”

1.10. Summary and Hypotheses

To summarize the above discussion, earnings management is a purposeful and lawful intervention into normal financial reporting procedures in order to alter the representation of the underlying economic performance of a company.

Managers manipulate earnings in order to ensure for themselves a higher compensation and brighter career perspectives, to attract financing at favorable rates, to meet debt covenants, to inflate stock prices (particularly during stock issuance), to optimize taxes or to meet regulatory requirements.

In public companies, the root of an earnings management problem arises out of a principal - agency conflict between the shareholders and management who might have different interests. The most efficient way to restrain earnings management is to build a strong corporate governance system. Among others, an effective corporate governance system presumes an adequate management remuneration scheme that helps to put in line the interests of shareholders and managers.

There are primarily two strategies for earnings management: Accrual-based earnings management and Real earnings management. The primary difference between them is the influence on company operations and cash flows. Under each of the strategies, financial managers

have a wide variety of techniques to choose from, for example manipulations with recognition of revenues and expenses, accounting estimates, classification of assets, production volumes, and sale of assets. Each of the strategies imply different costs and accessibility. Managers tend to use either strategy or both, and the choice between them might depend on company's financial condition and competitive status in the industry, degree of scrutiny by auditors, regulators and institutional investors, company accounting flexibility and tax environment. Due to the specifics of real earnings management, it should be used by the end of fiscal period, and then if needed, the financial result is calibrated with accrual-based earnings management. However, depending on the factors mentioned above, the proportion between real and accrual-based earnings would vary.

Earnings management has implications for subsequent company performance and also its reputation. In extreme cases, when earnings management becomes a fraud, a company may be ruined totally, as it happened with Enron Corp. and WorldCom Inc. Nevertheless, there is no common opinion on the influence of earnings management on subsequent operational performance. Some researchers find the negative cause-and-effect relationship between earnings management and performance, while other studies claim that the association is positive, and it is not necessarily causal one but rather an evidence of signaling effects.

The review of literature helped to build a foundation for this research and uncovered the research gap in the field of earnings management in Russia, particularly for companies reporting in compliance with IFRS. Based on these studies, and taking into account existing potential for research, the following hypotheses were formulated, which will be tested within the scope of this work:

Earnings management and earnings benchmarks

H1.1.: “Firms that just meet zero earnings benchmark (earnings are in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”

H1.2.: “Firms that just meet last year's earnings benchmark (year-on-year change in earnings is in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”

Factors affecting the choice of an earnings management strategy

H 2.1: “Other things being equal, firms facing greater scrutiny from auditors have a higher level of Real earnings management and a lower level of Accrual-based earnings management”

H 2.2: “Other things being equal, firms with higher accounting flexibility have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

H 2.3: “Other things being equal, firms with a better financial health have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

H 2.4: “Other things being equal, firms with higher institutional ownership have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

H 2.5: “Other things being equal, acceptance of Corporate Governance Code in Russia in 2014 led to a higher usage of Real earnings management and a lower usage of Accrual-based earnings management”

H 2.6: “Other things being equal, when economic conditions are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management.”

Timing of Real and Accrual-based earnings management

H3: “Real earnings management and Accrual-based earnings management are used sequentially; managers adjust the amount of Accrual-based earnings management depending on the outcome of Real earnings management”

Earnings management and corporate performance

H4: “Real earnings management is detrimental to subsequent company performance and its influence is more adverse as compared to effect of Accrual-based earnings management”

CHAPTER 2. RESEARCH METHODOLOGY AND RESULTS

2.1. Research Methodology

2.1.1. Data sample

This research was performed using IFRS data, since investors and other stakeholders primarily rely on IFRS reports in their analysis. Moreover, results of research based on IFRS data may be compared to the results of research, performed on the datasets from other countries.

In Russia, according to the Federal Law on Consolidated Financial Statements (2010), submission of IFRS reports is compulsory for public companies, whose shares are included in the quotation list, as well as for financial institutions. The obligation to publish IFRS reports for the mentioned companies came into force starting in 2012, after the adoption of IFRS in compliance with the Russian Government Decree No 107 as of 25 February 2011 on “The recognition of IFRS and clarifications thereto, for application on the territory of Russian Federation”.

Due to the high costs associated with preparation and audit of IFRS reports, very few companies not subject to above regulations submit IFRS reports voluntarily. Hence, the sample used in this research is limited only to the companies, for which IFRS reporting is mandatory. Financial institutions, such as banks and insurance companies, though obliged to report under IFRS, are excluded from the sample because of peculiarities of their accounting that do not allow to use the models for the estimation of earnings management proxies. Also, financial institutions operate in a very different and highly regulated operational environment, and thus they cannot be analyzed together with non-financial companies. Earnings management at financial institutions is also a widely-discussed topic in an academic society, however it falls into a separate field of research.

Considering the above-mentioned, the data sample comprises all public Russian non-financial companies, which publish financial statements prepared under IFRS, and whose shares are traded on Moscow Stock Exchange as well as on foreign exchanges. The time period selected for analysis is from 2011 to 2020. However, since some models require the use of 1 year and 2 year lagged variables, additional datapoints for the years 2009 and 2010 were collected. In total, the sample includes 170 companies, out of which 18 are traded on foreign exchanges, namely London Stock Exchange (UK), The Nasdaq Stock Market (USA) and Euronext Stock Exchange (Netherlands). Since not all companies were preparing IFRS reports within the timeframe 2011 – 2020, the dataset is an unbalanced panel. The full list of companies included in the sample is presented in Appendix 1.

The breakdown of companies by industry sectors according to the Thomson Reuters Business Classification (TRBC) is presented in Figure 1 below.

Breakdown of Data sample by industries (number of companies; share in total)

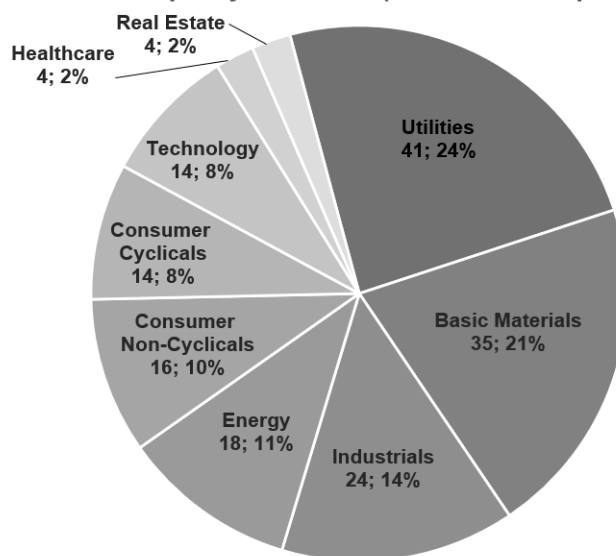


Figure 1. Breakdown of Data sample by industries

The largest sector comprising almost a quarter of the sample (41 companies) is represented by utilities companies which are involved in power generation and distribution. 35 companies from “Basic Materials” sector are in the business of mining and processing mineral resources such as iron, steel, gold, aluminum and other chemicals. “Industrials” sector is rather diversified and includes 24 companies that produce machinery, heavy vehicles, aerospace aggregates or provide transportation and logistics services. “Energy” companies are primarily oil & gas companies as well as coal producers. Companies from “Consumer Cyclical” and “Consumer Non-Cyclicals” sectors are the producers and retailers of durable and non-durable consumers goods such as automobiles or foods respectively. 14 technology companies are mostly the providers of telecom services. The two minor groups represent real estate and healthcare sectors, each including 4 companies.

All data was collected from Refinitiv (Thomson Reuters) database. Datapoints, which were missing in database, were collected manually using official audited financial statements published by the companies at their corporate websites. Statistical analysis was performed using STATA.

2.1.2. Description of models and variables

Estimation of Earnings management proxies

The first step in any research on the topic of earnings management is the measurement of earnings management proxies, since earnings management is not an indicator that can be readily obtained from corporate reports or any other public source. Unless the information on earnings management has been disclosed by the company itself or by any party that has performed due diligence of the company's books, earnings management can only be estimated using the models. The basic idea behind such models is the homogeneity of the companies across industry peers and over time, if industry tendencies are taken into account. Hence, if certain financial indicators, that are assumed to capture the effects of earnings management, are out of the league, these deviations are treated as the outcomes of a potential earnings management.

Estimation of Accrual-based earnings management proxies

To date, academics have made a lot of attempts to create a model that can properly estimate the proxies for earnings management. Most of these attempts were focused on the measurement of accrual-based earnings management, and the first model was proposed by Healy (1985). The Healy's model, very simple in construction, was built on the assumption that nondiscretionary accruals are constant over time, and that any variation in accruals is due to the management discretion. It is worth to mention that accruals is the difference between accounting profit and cash flows from operations. Accruals are inevitable under the accrual basis of accounting, under which revenues and expenses are recognized when they actually occur irrespective of the cashflows. Thus, accruals, below or above their normal level, can be referred to discretionary accruals that serve as a proxy for earnings management.

Jones (1991) proposed a model in which the assumption of constant discretionary accruals was relaxed. She offered a regression approach that is aimed to separate discretionary and non-discretionary components of the accruals. In essence, the Jones model presumes that changes in total assets, gross revenue, and gross property plant and equipment are the determinants of non-discretionary accruals. Any other accruals, not explained by these factors, are referred to discretionary accruals which can be managed by the companies. The Jones model has the following construction:

$$\frac{TACC_{i,t}}{A_{i,t-1}} = \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{\Delta S_{i,t}}{A_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

where:

- $TACC_{i,t}$ – total accruals of a company i for a year t ;
- $A_{i,t}$ – total assets of a company i as of the end of a year t .
- $\Delta S_{i,t}$ – change in revenue of a company i for a year t ;
- $PPE_{i,t}$ – the gross property, plant and equipment of a company i as of the end of a year t ;

Discretionary accruals is the difference between total accruals and non-discretionary accruals estimated by the Jones model, or simply the residuals $\varepsilon_{i,t}$ from the model (1), and can be calculated as follows:

$$AEM_{i,t} = \frac{DACC_{i,t}}{A_{i,t-1}} = \frac{TACC_{i,t}}{A_{i,t-1}} - \frac{\widehat{TACC}_{i,t}}{A_{i,t-1}} \quad (2)$$

- $AEM_{i,t}$ – proxy for accrual-based earnings management of a company i for a year t ;
- $TACC_{i,t}$ – total accruals of a company i for a year t ;
- $DACC_{i,t}$ – discretionary accruals of a company i for a year t ;
- $\widehat{TACC}_{i,t}$ – the level of normal or nondiscretionary accruals of a company i for a year t estimated by the Jones model;
- $A_{i,t}$ – total assets of a company i as of the end of a year t .

There are two approaches to calculate total accruals: balance sheet approach and cash flow approach. According to the balance sheet approach, as defined in (Dechow et al., 1995), total accruals can be calculated as follows:

$$TACC_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - \Delta Dep_{i,t} \quad (2.1)$$

- $\Delta CA_{i,t}$ – change in current assets of a company i for a year t ;
- $\Delta CL_{i,t}$ – change in current liabilities of a company i for a year t ;
- $\Delta Cash_{i,t}$ – change in cash and cash equivalents of a company i for a year t ;
- $\Delta STD_{i,t}$ – change in short-term debt of a company i for a year t ;
- $\Delta Dep_{i,t}$ – depreciation and amortization expenses of a company i for a year t ;

Alternatively, total accruals can be calculated using the cash flow approach:

$$TACC_{i,t} = NI_{i,t} - CFO_{i,t} \quad (2.2)$$

- $NI_{i,t}$ – net profit or loss after tax of a company i for a year t ;
- $CFO_{i,t}$ – cash flows from operations of a company i for a year t ;

Majority of the recent works on earnings management relied on the latter cash flow approach, since it is less susceptible to errors (Cohen et al., 2008; Zang, 2012; Nikulin & Zinchenko, 2015). Therefore, it was decided to use the cash flow approach in this research as well.

Jones model has become one the most popular models to estimate accrual-based earnings management and also served as a basis for the models developed afterwards. However, it has a flaw in that it ignores a potential managerial manipulation with revenues. Dechow et al. (1995) corrected this deficiency of the Jones model, and came up with the Modified Jones Model, that has gained a wide recognition among researchers. The only difference between the Modified Jones Model and original Jones model is the correction of revenue for the change in accounts receivable. The construction of the Modified Jones Model is as follows:

$$\frac{TACC_{i,t}}{A_{i,t-1}} = \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{\Delta S_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

- $TACC_{i,t}$ – total accruals of a company i for a year t ;
- $PPE_{i,t}$ – the gross property, plant and equipment of a company i as of the end of a year t ;
- $\Delta S_{i,t}$ – change in revenue for a company i for a year t ;
- $\Delta AR_{i,t}$ – change in accounts receivable for a company i for a year t ;
- $A_{i,t}$ – total assets of a company i as of the end of year t .

Discretionary accruals are estimated in the same way as with the Jones model and are equal to the residuals $\varepsilon_{i,t}$ from model (3).

$$AEM_{i,t} = \frac{DACC_{i,t}}{A_{i,t-1}} = \frac{TACC_{i,t}}{A_{i,t-1}} - \frac{\widehat{TACC}_{i,t}}{A_{i,t-1}} \quad (4)$$

- $AEM_{i,t}$ – proxy for accrual-based earnings management of a company i for a year t ;
- $TACC_{i,t}$ – total accruals of company i for a year t ;
- $DACC_{i,t}$ – discretionary accruals of company i for a year t ;

- $\widehat{TACC}_{i,t}$ – the level of normal or nondiscretionary accruals of a company i for year t estimated by the Modified Jones model;
- $A_{i,t}$ – total assets of a company i as of the end of a year t .

Modified Jones Model demonstrated more superior results as compared to the original Jones model when it was tested on the sample of firms that were alleged by the SEC in overstating their earnings (Dechow et al., 1995).

All the studies, mentioned in the first chapter, which served as a basis for the development of hypotheses, used either the Jones Model, as in Zang (2012), Gunny (2010) and Nikulin and Zinchenko (2015) or the Modified Jones model, as in Legget et al. (2016) and Cohen et al. (2008). Since Modified Jones Model is more superior to the Jones Model, it was decided to use the Modified Jones Model in the next steps of this research. It would be fair to mention that there exist at least ten other models for the estimation of accrual-based earnings management proxies (Callao et al., 2017). However, those models were used in the limited number of studies, so that their application to the data sample from Russia is questionable and subject to a separate study.

The regressions for either the Jones or Modified Jones models are supposed to be estimated cross-sectionally for every industry-year. In other words, for every industry and year there needs to be estimated a different set of $\beta_0 - \beta_3$ coefficients. However, due to the insufficient number of datapoints within the industries and/or within the years, it was decided to estimate regressions across the whole data set as pooled OLS regressions.

Estimation of Real Earnings management proxies

The variety of models for the estimation of real earnings management is not as wide as in the case of accrual-based earnings management. The first to explicitly formulate the model for the measurement of real earnings management was Sugata Roychowdhury who presented the model in his influential article “Earnings management through real activities manipulation” (Roychowdhury, 2006). Roychowdhury focused on the three methods of real earnings management, and for each of those he proposed a model for proxy estimation.

The first method is a manipulation with sales, such as generating additional sales through price discounts or more relaxed credit terms. The model to measure the proxy for sales manipulation is as follows:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta S_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (5)$$

- $CFO_{i,t}$ – cash flows from operations of a company i for a year t ;
- $A_{i,t}$ – total assets of a company i as of the end of year t ;
- $S_{i,t}$ – revenue of a company i for a year t ;
- $\Delta S_{i,t}$ – change in revenue of a company i for a year t ;

The goal of this model is to estimate the level of normal cash flows from operations, which is a function of assets, current year revenue and change in revenue. If a company manipulates with sales by providing discounts or lenient credit terms, then cash flows would be lower than what would have been, had the company done business in a regular way. Hence, residuals from the model (5), $\varepsilon_{i,t}$, represent a manipulation with sales.

The second method of real earnings management modelled by Roychowdhury is the reduction of discretionary expenditures such as SG&A, R&D and advertising. The model is as follows:

$$\frac{DISX_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (6)$$

- $DISX_{i,t}$ – the discretionary expenditures for a company i in a year t , represented by SG&A expenses (Selling, General and Administrative expenses);
- $A_{i,t}$ – total assets of a company i as of the end of year t ;
- $S_{i,t}$ – revenue of a company i for a year t ;

The model determines a normal level of discretionary expenditures which is a function of lagged sales. Residuals from model (6), $\varepsilon_{i,t}$, represent manipulations with discretionary expenditures.

The third method described by Roychowdhury is overproduction, which might be used by the companies to spread fixed costs over a larger number of produced goods, and this way to reduce the costs per 1 unit, and consequently total costs of goods sold. The model to measure the proxy for real earnings management with overproduction is as follows:

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta S_{i,t}}{A_{i,t-1}} + \beta_4 \frac{\Delta S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (7)$$

- $PROD_{i,t}$ – the production costs of a company i for a year t . Production costs calculated as the sum of the Cost of Goods Sold ($COGS_{i,t}$) and the change in inventory for a company i for a year t ($\Delta INV_{i,t}$);
- $A_{i,t}$ – total assets of a company i as of the end of year t ;
- $S_{i,t}$ – revenue of a company i for a year t ;
- $\Delta S_{i,t}$ – change in revenue of a company i for a year t ;

Following Cohen et al. (2008), the aggregate indicator of real earnings management is calculated as the sum of the proxies for all three real earnings management methods:

$$REM_{i,t} = R_PROD_{i,t} - R_SALES_{i,t} - R_DISX_{i,t} \quad (8)$$

- $REM_{i,t}$ – proxy for real earnings management of a company i in a year t ;
- $R_SALES_{i,t}$ – proxy for manipulation with sales of a company i in a year t , residuals from equation (5);
- $R_DISX_{i,t}$ – proxy for manipulation with discretionary expenditure of a company i in a year t , residuals from equation (6);
- $R_PROD_{i,t}$ – proxy for manipulation with production levels of a company i in a year t , residuals from equation (7);

$R_SALES_{i,t}$ and $R_DISX_{i,t}$ are taken with a negative sign (multiplied by -1) due to the construction of the model. $R_SALES_{i,t}$ is taken as negative because the higher the manipulation with sales, the less cash flows will company receive in the current accounting period. Likewise, the higher the manipulation with discretionary expenditures, the larger part of them was cut to increase earnings, and the lower will they be as compared to the normal levels of discretionary expenditures.

The regressions for the model developed by Roychowdhury, should be estimated cross-sectionally for every industry-year similarly to the Modified Jones models. However, due to the insufficiency of datapoints within the industries and/or within the years, it was decided to estimate regressions across the whole data set as pooled OLS regressions.

There exists an alternative model for the measurement of real earnings management, developed by Gunny (2010). Gunny's model is based on the Roychowdhury's model and is more sophisticated in that it separates the manipulation with discretionary expenditures into

manipulation with R&D and SG&A, and also accounts for the earnings management via the sale of assets. However, in contrast to the Roychowdhury's model, which is based purely on financial statements indicators, Gunny's model requires market value indicators such as Tobin's Q or Market capitalization. As market values are not available for the whole dataset, Gunny's model was not considered as a primary model choice to estimate real earnings management proxy. Moreover, Gunny's model is not as popular as Roychowdhury's model which was used in the following works: Zang (2012), Chen et al. (2010), Cohen and Zarowin (2010), Cohen et al. (2008), and Beyer et al. (2018). Hence, it was decided to measure real earnings management proxies with the Roychowdhury model.

To sum up, for the purposes of this research, the proxies for accrual-based earnings management were estimated with the Modified Jones Model (Dechow et al., 1995) while the proxies for real earnings management were estimated with the Roychowdhury's model (Roychowdhury, 2006).

Hypotheses tests

After estimating the proxies for earnings management, the next step is to proceed with further calculations and hypothesis tests. To eliminate extreme observations, all the continuous variables, including the variables used to calculate the proxies for earnings management, were winsorized at the 1th and 99th percentiles. 1th and 99th percentiles is a level used in most of the works discussed in chapter 1, e.g., in Zang (2012), Gunny (2010) and Cohen et al. (2008). Analysis of outliers also showed that this is the optimal level that simultaneously would allow to preserve data and still help to get rid of abnormal observations. The hypotheses were tested using either Fama and MacBeth regressions or panel data regression models. The exact choice will be specified for each particular hypothesis. Whenever panel data models were used, the choice between the pooled regression, the regression with fixed effects and the regression with random effects was made using the F-test, the Breusch-Pagan test and the Hausman test (appendix 3). All models were checked for multicollinearity using the variance inflation factors (appendix 4). The models were also checked for heteroscedasticity of residuals using the Wald test and for autocorrelation using the Wooldridge test. In order to account for heteroskedasticity and autocorrelation, the cluster-robust standard errors were used.

Next, the models used to test each of the hypothesis will be presented.

H.1. Earnings benchmarks and earnings management

Hypotheses H 1.1 and H 1.2 were tested using the following regression model:

$$REM_{i,t} \text{ or } AEM_{i,t} = \beta_0 + \beta_1 JustMeet0_{i,t} \text{ or } JustMeetLY_{i,t} + \beta_2 LnAssets_{i,t} + \beta_3 MtoB_{i,t} + \beta_4 ROA_{i,t} + \varepsilon_{i,t} \quad (9)$$

Dependent variables:

- $REM_{i,t}$ – proxy for real earnings management of a company i in a year t as calculated from equation (8);
- $AEM_{i,t}$ – proxy for accrual-based earnings management of a company i in a year t as calculated from equation (4);

Independent variables:

- $JustMeet0_{i,t}$ – binary variable, equal to "1" if net income divided by lagged total assets is higher than 0.00 and less than 0.01, "0" – otherwise;
- $JustMeetLY_{i,t}$ – binary variable, equal to "1" if year-on-year change in net income divided by lagged total assets is higher than 0 and less than 0.01, "0" – otherwise;

Control variables:

- $LnAssets_{i,t}$ – natural log of the value total assets of a company i as of the end of year t ;
- $MtoB_{i,t}$ – Market-to-Book ratio of a company i as of the end of year t ;
- $ROA_{i,t}$ – return on assets of a company i in a year t , calculated as net income for a year t divided by average total assets in the beginning of year t and in the end of year t ;

Model description:

The primary goal of the model is to help to investigate the association between the level of earnings management and whether the company just meets zero or last earnings benchmarks. Also, the model will help to establish the presence of an earnings management and verify the adequacy of models that are used to estimate the earnings management proxies.

A company is considered to just meet zero earnings benchmark if its net income after taxes scaled by lagged total assets is in the range between 0 and 0.01, where the company is most likely to manipulate earnings. Similar range was chosen in the research by Gunny (2010). Zang (2012) and Roychowdhury (2006) used the range 0 – 0.005, however this range would leave very few observations. Besides, in Russia as in other emerging countries, the nominal returns are generally higher as compared to developed countries due to the higher inflation and risk premiums, so the

range 0 – 0.01 is rather justified. Thus, the binary variable $JustMeet0_{i,t}$ is equal to "1" if net income divided by lagged total assets is in the range 0.00 - 0.01, and "0" otherwise.

Likewise, a company is considered to just meet last year earnings benchmark if its year-on-year change in net income scaled by lagged total assets is in the range between 0 and 0.01. The range was chosen based on the analysis of the sample distribution so that the sample would include a reasonable number of observations. Similar threshold of 0.01 was also used by Gunny (2010). Hence, the binary variable $JustMeetLY_{i,t}$ is equal to "1" if year-on-year change in net income scaled by lagged total assets is higher than 0 and less than 0.01, and "0" – otherwise.

Since companies that are close to meeting earnings benchmarks may still have an incentive to manipulate earnings, in order to increase the power of the tests such firm-years were excluded from the sample. Particularly there were excluded the firm-year when net income after taxes scaled by lagged total assets is in the range between -0.01 and 0 in the case of the first hypothesis, and in the case of the second hypothesis, the firm-years when net income *fell* over the previous year by less than 0.01 of the lagged total assets.

As for the control variables, log of total assets was included to control for the size effects, market-to-book ratio controls for the growth opportunities, and return on assets controls for the current performance of the company. The choice of control variables generally coincides with the selection by Gunny (2010), Zang (2012) and Roychowdhury (2006).

Following (Roychowdhury, 2006) and (Gunny, 2010), regressions for equation (9) were calculated using Fama and MacBeth methodology. The coefficients of regressions and the corresponding t-statistics / p-values were estimated cross-sectionally every year over the period 2011–2020, and calculated in compliance with Fama and MacBeth procedure. In total, 4 models were built: for 2 types of earnings management (real earnings management, accrual-based earnings management) and for 2 types of benchmarks (0 earnings benchmark and last year earnings benchmark).

It is expected that the coefficient β_1 for the variables $JustMeet0_{i,t} / JustMeetLY_{i,t}$ will be positive and significant denoting that companies that just meet earnings benchmarks apply earnings management to greater extent as compared to the companies that clearly beat or miss earnings benchmarks and thus have less incentive to manage earnings. The results are presented and discussed in the next section (2.2.).

H.2. Factors affecting the choice of an earnings management strategy

Hypotheses H 2.1 – H 2.6 were tested using the following set of regression models:

$$\begin{aligned} REM_{i,t} = & \beta_0 + \beta_1 Zscore_{i,t} + \beta_2 INST_{i,t} + \beta_3 Big4_{i,t} + \beta_4 AUD_TEN_{i,t} + \beta_5 CGC_t + \\ & + \beta_6 NOA_{i,t-1} + \beta_7 Cycle_{i,t} + \beta_8 GDP_t + \beta_9 ROA_{i,t} + \beta_{10} LnAssetsIndAdj_{i,t} + \\ & + \beta_{11} MtoB_{i,t} + \beta_{12} Leverage_{i,t} + \beta_{13} IncomePreEM_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (10)$$

$$\begin{aligned} AEM_{i,t} = & \beta_0 + \beta_1 Zscore_{i,t} + \beta_2 INST_{i,t} + \beta_3 Big4_{i,t} + \beta_4 AUD_TEN_{i,t} + \beta_5 CGC_t + \\ & + \beta_6 NOA_{i,t-1} + \beta_7 Cycle_{i,t} + \beta_8 GDP_t + \beta_9 ROA_{i,t} + \beta_{10} LnAssetsIndAdj_{i,t} + \beta_{11} MtoB_{i,t} + \\ & + \beta_{12} Leverage_{i,t} + \beta_{13} PredREM_{i,t} + \beta_{14} UnexpectedREM_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (11)$$

Dependent variables:

- $REM_{i,t}$ – proxy for real earnings management of a company i in a year t as calculated from equation (8);
- $AEM_{i,t}$ – proxy for accrual-based earnings management of a company i in a year t as calculated from equation (4);

Independent variables:

- $Zscore_{i,t}$ – Altman's Z score of a company i in a year t ;
- $INST_{i,t}$ – percentage of institutional ownership of a company i as of the end of a year t ;
- $Big4_{i,t}$ – binary variable, equals to "1" if external auditor of a company i in a year t is one of "Big4" audit companies, "0" – otherwise;
- $AUD_TEN_{i,t}$ – audit tenure, the cumulative number of years until the year t when a company i is audited by a single auditor. AUD_TEN is set to "1" in the year 2011, goes up by 1 every year and is reset to "1" each year the auditor is changed;
- CGC_t – binary variable to account for the approval of Corporate Governance Code in Russia, is equal to "1" if t is higher than or equal to 2015, "0" – otherwise;
- $NOA_{i,t-1}$ – variable that captures accrual-based earnings management in prior years. $NOA_{i,t-1}$ is calculated as net operating assets of a company i in the beginning of a year t scaled by 1-year lagged revenues adjusted for the same period industry median;
- $Cycle_{i,t}$ – length of operating cycle of a company i in a year t expressed in days (the number of days to collect receivables plus the days in inventory less the days to pay creditors);
- GDP_t – relative change in GDP in Russia (in constant prices) for a year t ;
- $UnexpectedREM_{i,t}$ – estimated residuals $\varepsilon_{i,t}$ from equation (10) ;

Control variables:

- $ROA_{i,t}$ – return on assets of a company i in a year t . $ROA_{i,t}$ is calculated as the net income after taxes of a company i for a year t divided by average total assets in the beginning of a year t and in the end of year t ;
- $LnAssetsIndAdj_{i,t}$ – natural logarithm of total assets of a company i as of the end of a year t adjusted for the same period industry median;
- $MtoB_{i,t}$ – Market-to-Book ratio of a company i as of the end of year t ;
- $Leverage_{i,t}$ – total debt divided by total assets of a company i as of the end of a year t ;
- $IncomePreEM_{i,t}$ – earnings of a company i before the application of any earnings management in a year t scaled by 1-year lagged total assets;
- $PredREM_{i,t}$ – predicted amount of real activities manipulation, $\widehat{REM}_{i,t}$ from equation (10);

Model description:

The hypotheses 2.1. – 2.6. presume that factors affecting the choice between real and accrual-based earnings management are essentially the costs, since any form of earnings management entails the risks of detection and is performed when non-manipulated earnings deviate from targets. In other words, managers are assumed to trade-off between the strategies based on the relative costliness of each strategy. At the same time, it does not mean that the choice is discrete: managers may still use both strategies, but the magnitude of each will depend on the factors described in section 1.7. Since both earnings management strategies are studied concurrently, the hypotheses were tested using the system of equations (10) and (11). In the equations (10) and (11), independent variables correspond to the factors that allegedly influence the choice of an earnings management strategy, and due to a tradeoff nature of the choice, the signs of coefficients in front of independent variables are assumed to be opposite in the resulting model outputs. Next, each of the variables will be described via the perspective of the hypotheses set forward.

H 2.1: “Other things being equal, firms facing greater scrutiny from auditors have a higher level of Real earnings management and a lower level of Accrual-based earnings management.”

The degree of scrutiny from auditors is operationalized via the independent variables $Big4_{i,t}$ and $AUD_TEN_{i,t}$.

$Big4_{i,t}$ is a binary variable that equals "1" if external auditor of a company belongs to a group of "Big4" audit companies ("PwC", "KPMG", "EY" or "Deloitte") and "0" – otherwise. Since a high-quality auditor is a powerful constraining force for accrual-based earnings management that is a priori easier to detect, the coefficient β_3 in front of $Big4_{i,t}$ is expected to be positive in REM equation (10) and negative in AEM equation (11). Similar binary variable was used in the research by Becker et al. (1998), Cohen and Zarowin (2010) and Zang (2012). Becker et al. (1998) investigated the relationship between audit quality and accrual-based earnings management, Cohen and Zarowin (2010) focused on real earnings management, and Zang (2012) considered both strategies as in this research. Expected signs are based on the results obtained in the mentioned publications.

$AUD_TEN_{i,t}$ is an audit tenure, a period for which a company is audited by one audit firm without change of auditor. In the literature it is possible to find several ways to estimate audit tenure, but in this research, tenure is calculated as the cumulative number of years starting in 2011 (the first year in data sample), when a company is audited by one audit firm. Every year audit tenure increases by 1 and when an auditor changes year counting starts again from 1. Cohen and Zarowin (2010) showed that the longer the audit tenure, the higher is the level of real earnings management due to the growing expertise of an auditor. Zang (2012) confirmed the findings of Cohen and Zarowin (2010) and additionally found a negative relationship between audit tenure and accrual-based earnings management. Therefore, similarly to β_3 , β_4 is expected to be positive in REM equation (10) and negative in AEM equation (11).

H 2.2: "Other things being equal, firms with higher accounting flexibility have a lower level of Real earnings management and a higher level of Accrual-based earnings management"

Accounting flexibility is measured with two variables $NOA_{i,t-1}$ and $Cycle_{i,t}$.

$NOA_{i,t-1}$ is net operating assets scaled by 1-year lagged revenues. The indicator is taken as of the beginning of the year t and is adjusted for the industry median calculated over the same period. In other words, median of $NOA_{i,t-1}$ calculated over the companies belonging to one TRBC sector is subtracted from $NOA_{i,t-1}$ for the same year. Net operating assets is calculated as shareholders' equity plus total debt less cash and marketable securities.

The logic behind the variable is that the use of accrual-based earnings management finds its reflection in the balance sheet and leads to inflated net operating assets, for example increased accounts receivable or reduced unearned revenue. Hence, the indicator is used to capture the effects of accrual-based earnings management used previously. To account for the differences in the level of NOA across the industries, the variable is adjusted for industry median. It is expected

that the higher is the level of net operating assets relative to normal levels, the less flexibility managers have to apply accrual-based earnings management and will be forced to use real earnings management. Hence, the coefficient β_6 in front of $NOA_{i,t-1}$ is expected to be positive in REM equation (10) and negative in AEM equation (11). The indicator $NOA_{i,t-1}$ was selected after (Cohen & Zarowin, 2010) and (Zang, 2012).

$Cycle_{i,t}$ is the length of operating cycle in days and is calculated as the days to collect receivables plus the days in inventory less the days to pay creditors. If $NOA_{i,t-1}$ measures available accounting flexibility that companies have after they had used accrual-based earnings management, $Cycle_{i,t}$ accounts for potential accounting flexibility that companies have due to the specifics of their business. For example, companies, that produce heavy machinery, have higher level of accruals as compared to retailers selling fast-moving consumer goods. Hence, if companies naturally have large accruals, they have more opportunities to use accrual-based earnings management that can be hidden in large accruals. Therefore, the coefficient β_7 in front of $Cycle_{i,t}$ is expected to be negative in REM equation (10) and positive in AEM equation (11). Sign expectations go in line with results obtained by Zang (2012).

H 2.3: “Other things being equal, firms with a better financial health have a lower level of Real earnings management and a higher level of Accrual-based earnings management”

Financial health is operationalized with Altman's Z score ($Zscore_{i,t}$) which is calculated for each company i in a year t (Altman, 1968). Altman's Z score model was originally created to predict corporate bankruptcies and so can be used as a good proxy for overall financial health of a company. It is a rather popular proxy for financial health and was used in many research works on earnings management, for instance in Zang (2012), Tabassum et al. (2015) and Gunny (2010).

The model specification is as follows:

$$Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5,$$

- X_1 – Working Capital / Total Assets (Working Capital = Current Assets - Current Liabilities);
- X_2 – Retained Earnings / Total Assets;
- X_3 – Earnings before interest and taxes (Operating Income) / Total Assets;
- X_4 – Market Value of Equity / Book Value of Total Liabilities;
- X_5 – Revenues / Total Assets;

Higher values of the Z score, calculated from the above formula, point at a better financial condition. If the Z score is above 2.99, the probability of bankruptcy is remote. If the Z-score is

below 1.81, the company might experience financial problems and be a candidate for bankruptcy. If the Z score is between 1.81 and 2.99, no definite conclusion can be made and a more thorough examination of the company is needed. Since the discrimination of companies into the groups of healthy and potentially bankrupt companies is not required, the Z score was used plainly as a continuous variable.

It was hypothesized that the healthier the company is, the less its managers would deviate from normal course of business and interfere with real operations. Therefore, the coefficient β_1 in front of $Zscore_{i,t}$ is expected to be negative in REM equation (10) and positive in AEM equation (11). In contrast, if a company has financial difficulties, in fear of accrual reversals and snowballing effect, managers might prefer real earnings management over accrual-based earnings management. On the other hand, the opposite relationship is also theoretically possible. If company's financial performance is solid, managers feel themselves more flexible to deviate from normal business practices and thus they would turn to real earnings management. The empirical results will reveal which of the relationships is true for the Russian market.

H 2.4: "Other things being equal, firms with higher institutional ownership have a higher level of Accrual-based earnings management and a lower level of Real earnings management."

Institutional investors can be regarded as a restraining force for earnings management since they hold large stock packages, may nominate representatives to the board and generally exert tight control and monitoring over managers. Since real earnings management is supposedly detrimental to the company value, institutional investors might take attempts to restrain it, leaving managers with an only choice of accrual-based earnings management. Institutional ownership is operationalized by the variable $INST_{i,t}$ and was measured as 1 minus the free float rate, i.e., the proportion of stocks freely traded on the stock exchange. Considering the above discussion, the coefficient β_2 in front of $INST_{i,t}$ is expected to be negative in REM equation (10) and positive in AEM equation (11). Negative association between institutional ownership and real earnings management was detected by Roychowdhury (2006), while Zang (2012) who also found a positive relationship with accrual-based earnings management.

H 2.5: "Other things being equal, acceptance of Corporate Governance Code in Russia in 2014 led to the lower usage of Accrual-based earnings management and a higher usage of Real earnings management."

Adoption of Corporate Governance Code is operationalized via the binary variable CGC_t that is equal to "1" if t is higher than or equal 2015, and "0" – otherwise. It is hypothesized that after the acceptance of Corporate Governance Code, corporate governance, monitoring and

transparency have improved, making it harder for the managers to engage in accrual-based earnings management. The logic behind the variable is similar to the binary variable “SOX” included into the models of Cohen et al. (2008) and Zang (2012) that accounted for the enactment of Sarbanes-Oxley Act in 2002 in USA. The coefficient β_5 in front of CGC_t is expected to be positive in REM equation (10) and negative in AEM equation (11).

H 2.6: “Other things being equal, when economic conditions are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management.”

Company financial health is a company-specific factor that is assumed to affect earnings management strategy choice. However, external environment and economy around the company might also influence the managerial decisions on earnings management. It was decided to incorporate the factor of external environment with the help of variable GDP_t that is equal to the relative change in real GDP in Russia (in constant prices) over a year t . Cohen et al. (2008) found a strongly negative association between GDP change and earnings management. In case of this research, it is hypothesized that when economy flourishes, managers expect that growing earnings would cover any accrual reversals and prefer not to interfere with operational activities. Therefore, it is expected that the coefficient β_8 in front of GDP_t be negative in REM equation (10) and positive in AEM equation (11).

UnexpectedREM_{i,t} is the residuals $\varepsilon_{i,t}$ from REM equation. This variable was used to verify hypothesis H3 on the sequential usage of earnings management strategies and will be explained in the upcoming section.

Next, control variables will be discussed.

$ROA_{i,t}$ is a return on assets of a company i in a year t , and is added to the model to control for current company performance. $MtoB_{i,t}$ is a Market-to-Book ratio of a company i as of the end of year t , a variable that controls for the company growth opportunities. $LnAssetsIndAdj_{i,t}$ is a natural logarithm of total assets of a company i as of the end of a year t , and is used to control for the company size. However, to increase the power of the tests, this variable was adjusted for the same period industry median to control for the relative size of the company in the industry. This technique was used by Zang (2012) and appears reasonable to be used in this research as well.

ROA, MtoB and Assets size are standard control variables used in the majority of multivariate regressions that help to reveal the relationship between earnings management and some other phenomenon, e.g., in models used by Legget et al. (2016), Roychowdhury (2006), Tabassum et al. (2015), Chen et al. (2010) and Gunny (2010). Additionally, $Leverage_{i,t}$ was added

as a control variable to control for the level of indebtedness that was found to be a factor affecting the choice of an earnings management strategy (Nikulin & Zinchenko, 2015).

$IncomePreEM_{i,t}$ is a pre-managed earnings before any earnings management, scaled by 1-year lagged total assets and is calculated as $NI_{i,t} - REM_{i,t} - AEM_{i,t}$. This variable is included in the REM equation (10) and controls for the motivation to meet earnings benchmarks. β_{13} in front of $IncomePreEM_{i,t}$ is expected to be negative, what signifies that if pre-managed earnings are insufficient to meet the target, managers will revert to earnings management to make up the difference.

$PredREM_{i,t}$ is the predicted amount of real activities manipulation or $\widehat{REM}_{i,t}$ from equation (10) and is included in AEM equation (11). This variable controls for the volume of income increasing earnings management targeted by the managers. Even though it is hypothesized that both earnings management strategies are substitutes, it is necessary to control for the initial gap in earnings that needs to be filled with earnings management.

H.3. Timing of Real and Accrual-based earnings management

The hypothesis H 3 was tested using the same models (10) and (11) that were used to verify the hypotheses 2.1. – 2.6. The variable, that was used to test H3 is the *UnexpectedREM_{i,t}* in the AEM equation (11).

UnexpectedREM_{i,t} is calculated as the residuals $\varepsilon_{i,t}$ from REM model (10) and denotes the difference between the actual and expected levels of real earnings management, or in other words, the level of *unexpected* real earnings management. The coefficient β_{14} in front of *UnexpectedREM_{i,t}* in AEM equation (11) is expected to be negative suggesting that managers apply accrual-based earnings management after they see the result of real earnings management and the magnitude of accrual-based earnings management depends on the amount of unrealized real earnings management.

However, it is also possible that negative and significant coefficient in front of *UnexpectedREM_{i,t}* does not necessarily imply the sequential nature of *decisions* on earnings management strategy. It might be the case that managers make a decision at a single point of time which earnings management strategy to use first and to what extent. If this is true, the outcome of real earnings management does not actually influence on the decision to use accrual-based earnings management. For example, Barton (2001) investigated the relationship between derivatives and accruals earnings management as the two alternatives to smooth out earnings. With the help of Hausman 1978 test, he found that derivatives and accrual-based earnings management are substitutes, but are used in the result of a single decision. Zang (2012) also used the Hausman 1978 test to verify the causal relationship between real and accrual-based earnings management and found that unrealized real earnings management is the determinant of accrual-based earnings management.

The mechanics of the Hausman 1978 test is as follows. In the first stage, predicted values from the models (10) and (11) were obtained, that are in effect the predicted levels of real and accrual-based earnings management, and also can be regarded as the instruments for *REM_{i,t}* and *AEM_{i,t}*. In the second stage, the following two regression models were constructed which are the modifications of the models (10) and (11):

$$\begin{aligned} REM_{i,t} = & \beta_0 + \beta_1 Zscore_{i,t} + \beta_2 INST_{i,t} + \beta_3 Big4_{i,t} + \beta_4 AUD_TEN_{i,t} + \beta_5 CGC_t + \\ & + \beta_6 NOA_{i,t-1} + \beta_7 Cycle_{i,t} + \beta_8 GDP_t + \beta_9 ROA_{i,t} + \beta_{10} LnAssetsIndAdj_{i,t} + \beta_{11} MtoB_{i,t} + \\ & + \beta_{12} Leverage_{i,t} + \beta_{13} IncomePreEM_{i,t} + \beta_{14} AEM_{i,t} + \beta_{15} PredAEM_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (12)$$

$$\begin{aligned}
AEM_{i,t} = & \beta_0 + \beta_1 Zscore_{i,t} + \beta_2 INST_{i,t} + \beta_3 Big4_{i,t} + \beta_4 AUD_TEN_{i,t} + \beta_5 CGC_t + \\
& + \beta_6 NOA_{i,t-1} + \beta_7 Cycle_{i,t} + \beta_8 GDP_t + \beta_9 ROA_{i,t} + \beta_{10} LnAssetsIndAdj_{i,t} + \beta_{11} MtoB_{i,t} + \quad (13) \\
& + \beta_{12} Leverage_{i,t} + \beta_{13} PredREM_{i,t} + \beta_{14} UnexpectedREM_{i,t} + \beta_{15} REM_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Model (12) is based on the REM model (10) to which two extra variables were added: $AEM_{i,t}$ (with the coefficient β_{14}) and $PredAEM_{i,t}$ (with the coefficient β_{15}). Likewise, model (13) is based on the AEM model (11) to which an extra variable $REM_{i,t}$ (with the coefficient β_{15}) was added. The variable $PredREM_{i,t}$ was already a part of the model (11).

$PredREM_{i,t}$ and $PredAEM_{i,t}$ are the predicted amount of real and accrual-based earnings management respectively, as estimated by the REM model (10) and AEM model (11). These are also the instrumental variables for $REM_{i,t}$ and $AEM_{i,t}$.

According to the Hausman test, if real earnings management is determined before accrual-based earnings management, then $REM_{i,t}$ should be exogenous in the AEM model (13), i.e., determined outside of the model. If the coefficient of instrument $PredREM_{i,t}$ (β_{13}) is insignificant, while the coefficient β_{15} in front of $REM_{i,t}$ is significant, then it means that the Hausman test confirms the exogeneity of $REM_{i,t}$ in the AEM model (13), i.e., $REM_{i,t}$ is determined outside of the model and is not correlated with the AEM model's error term $\varepsilon_{i,t}$ (13).

On the other hand, if the coefficient of the instrument $PredAEM_{i,t}$ (β_{15}) in the model (12) is significant, while the coefficient β_{14} in front of the variable $AEM_{i,t}$ is not significant, then it means that the Hausman test reject the exogeneity of $AEM_{i,t}$ in the REM model (12), i.e., $AEM_{i,t}$ is not determined outside the model and is correlated with REM model's error term $\varepsilon_{i,t}$ (12).

If the results of the Hausman test as well as the coefficient β_{14} in front of the variable $UnexpectedREM_{i,t}$ in AEM equation (11) is significantly negative, then it can be concluded that the magnitude of accrual-based earnings management is determined based on the realized real earnings management.

H.4. Earnings management and corporate performance

Hypotheses H4 was tested using the following regression model:

$$ROA_IndAdj_{i,t+1,2,3} = \beta_0 + \beta_1 REM_d_{i,t} + \beta_2 AEM_d_{i,t} + \beta_3 BOTH_d_{i,t} + \beta_4 ROA_IndAdj_{i,t} + \beta_5 LnAssets_{i,t} + \beta_6 Zscore_{i,t} + \beta_7 MtoB_{i,t} + \varepsilon_{i,t} \quad (14)$$

Dependent variables:

- $ROA_IndAdj_{i,t+1,2,3}$ – return on assets of a company i in a year $t+1$, $t+2$ or $t+3$ adjusted for industry median;

Independent variables:

- $REM_d_{i,t}$ – binary variable, equals to "1" if a firm-year is above the 80th percentile in the REM distribution and below 80 percentile in AEM distribution , "0" – otherwise;
- $AEM_d_{i,t}$ – binary variable, equals to "1" if a firm-year is above the 80th percentile in the AEM distribution and below 80 percentile in REM distribution , "0" – otherwise;
- $BOTH_d_{i,t}$ – binary variable, equals to "1" if a firm-year is above the 80th percentile in both REM and AEM distributions, "0" – otherwise;

The detailed description of the procedure for the construction of AEM / REM / BOTH distributions and determination of independent variables $REM_d_{i,t}$, $AEM_d_{i,t}$ and $BOTH_d_{i,t}$ is presented next in “Model description” section.

Control variables:

- $ROA_IndAdj_{i,t}$ – return on assets of a company i in a year t adjusted for industry median;
- $LnAssets_{i,t}$ – natural log of the value of total assets of a company i as of the end of year t ;
- $Zscore_{i,t}$ – Altman's Z score of a company i in a year t ;
- $MtoB_{i,t}$ – Market-to-Book ratio of a company i as of the end of year t ;

Model description:

The equation (14) is used to analyze the association between earnings management and subsequent company performance.

Company performance is operationalized via the “Return on Assets” (ROA), which is calculated as net income for a year t divided by average total assets in the beginning of year t and in the end of year t . In order to account for the specifics of different industries and to increase the power of the model, ROA was adjusted for the industry median. So, $ROA_IndAdj_{i,t}$ is the difference between $ROA_{i,t}$ and median ROA across the same TRBC sector in which company i operates.

Industry adjusted ROA was used by Chen et al. (2010), Gunny (2010), Cohen and Zarowin (2010), and Beyer et al. (2018), and established itself as a solid proxy for company performance in the context of earnings management research. Alternatively, Return on Equity (ROE) could have been used as a proxy for performance, which is an important indicator for investors. However, there is a flaw with this performance measure in that companies with negative equity and negative income show high and positive ROE despite their performance is weak. Therefore, an option to use ROE was dismissed. In order to verify the effect not only on the next year performance, but for subsequent years as well, three versions of the models were calculated: for $t+1$, $t+2$ and $t+3$ periods.

Independent variables $REM_{i,t}$, $AEM_{i,t}$, and $BOTH_{i,t}$ are the binary variables.

$REM_{i,t}$ is equal to “1” if:

- a firm-year is above the 80th percentile in the REM distribution, i.e., when all $REM_{i,t}$ values within a year (from 2011 to 2020) and industry sector are sorted in the descending order, and the value of REM of the corresponding firm-year is in the top 20% of the distribution, **AND**
- the same firm-year is below the 80th percentile of the respective AEM distribution.

$AEM_{i,t}$ is equal to “1” if:

- a firm-year is above the 80th percentile of the AEM distribution, **AND**
- a firm-year is below the 80th percentile of the REM distribution.

$BOTH_{i,t}$ is equal to “1” if:

- a firm-year is above the 80th percentile of the AEM distribution, **AND**
- a firm-year is above the 80th percentile of the REM distribution.

Hence, for every year and industry sector a threshold at the 80th percentile was determined against which the REM/AEM values were compared in order to assign a value of 1/0 to the binary variables $REM_{i,t}$, $AEM_{i,t}$ and $BOTH_{i,t}$.

Similar methodology was used in (Gunny, 2010) with a threshold of the 80th percentile, while Chen et al. (2010) used a threshold of 67th percentile.

80th percentile is associated with a higher level of earnings management as compared to 67th percentile, so the base calculations will be built using the 80th percentile threshold. In addition, as a robustness check, the models will be recalculated using the of 67th percentile. The following

scheme will be used to make a conclusion on the association between earnings management and performance:

- if the variable ($REM_{i,t}$, $AEM_{i,t}$ or $BOTH_{i,t}$) is significant in both 80th and 67th percentile models, the obtained result allows to make a conclusion on the association between earnings management and performance;

- if significance is observed only for the 80th percentile, the result would also allow to make a conclusion, since in the case of the 80th percentile, the level of earnings management is higher than that for the 67th percentile;

- if the variable ($REM_{i,t}$, $AEM_{i,t}$ or $BOTH_{i,t}$) is significant for the 67th percentile but not significant for the 80th percentile, it means that significant association is observed only in the range between 67th and 80th percentiles and not above the 80th percentile. In this case, it is not feasible to make any conclusions on the association between earnings management and performance.

The coefficients β_1 , β_2 , β_3 measure the difference in future industry-adjusted operating performance of the REM, AEM and BOTH groups relative to the base group with a lower level of earnings management.

The control variables $ROA_{IndAdj_{i,t}}$, $LnAssets_{i,t}$, $Zscore_{i,t}$ and $MtoB_{i,t}$ are used to control for current financial performance, company size, overall financial health and growth opportunities. Similar set of controls was used by Chen et al. (2010), Gunny (2010), Beyer et al. (2018) and Legget et al. (2016).

The specification of the model (14) allows not only to verify the relationship between the performance and a particular earnings management strategy, but also to measure the relative influence of either strategy on performance. It can be done by comparing the coefficients β_1 and β_2 in front of the variables $REM_{i,t}$ and $AEM_{i,t}$ respectively with the help the F-test.

In compliance with hypothesis 4, it is expected that the coefficient β_1 in front of $REM_{i,t}$ would be significantly negative, while the coefficient β_2 in front of $AEM_{i,t}$ would be either insignificant or significant but lower in magnitude than β_2 .

It would be fair to mention that the models used by researchers, who investigated the association between earnings management and performance, for example Chen et al. (2010), Gunny (2010), Beyer et al. (2018) and Legget et al. (2016), had a slightly different construction. The independent variables, used in these models, accounted not only for earnings management

(such as $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$) but also for the state of meeting an earnings benchmark. To put it different, binary variable is equal to 1 if a firm-year is above certain threshold in REM / AEM distribution AND a company meets an earnings benchmark. Alternatively, interaction terms of two binary variables were used, and the conclusion was made by analyzing the interaction terms. With such a model design, the coefficients in front of binary variables would measure the difference in future operating performance of the companies that met earnings benchmark using either of the earnings management methods relative to the group which did not use earnings management and missed the benchmark.

In this case, the equation (14) would become as follows:

$$\begin{aligned}
 ROA_IndAdj_{i,t+1,2,3} = & \beta_0 + \beta_1 REM_{d_{i,t}} + \beta_2 AEM_{d_{i,t}} + \beta_3 BOTH_{d_{i,t}} + \\
 & + \beta_4 NONE_{d_{i,t}} + \beta_5 MEET_{d_{i,t}} + \beta_6 ROA_IndAdj_{i,t} + \beta_7 LnAssets_{i,t} + \beta_8 Zscore_{i,t} + \\
 & + \beta_9 MtoB_{i,t} + \beta_{10} GDP_{t+1,2,3} + \varepsilon_{i,t} \text{ where:}
 \end{aligned} \tag{15}$$

$REM_{d_{i,t}}$ – binary variable, equal to "1" if a firm-year is above the 80th percentile in the REM distribution and below the 80th percentile in AEM distribution, **AND** a company just meets any of the earnings benchmarks (zero or last year); "0" – otherwise;

$AEM_{d_{i,t}}$ – binary variable, equal to "1" if a firm-year is above the 80th percentile in the AEM distribution and below the 80th percentile in REM distribution, **AND** a company just meets any of the earnings benchmark (zero or last year); "0" – otherwise;

$BOTH_{d_{i,t}}$ – binary variable, equal to "1" if a firm-year is above the 80th percentile in the REM distribution and above the 80th percentile in AEM distribution, **AND** a company just meets any of the earnings benchmark (zero or last year); "0" – otherwise;

$NONE_{d_{i,t}}$ – binary variable, equal to "1" if a firm-year is below the 80th percentile in the REM distribution and below the 80th percentile in AEM distribution, **AND** a company just meets any of the earnings benchmarks (zero or last year); "0" – otherwise;

$MEET_{d_{i,t}}$ – binary variable, equal to "1" if a company surely meets any of the earnings benchmarks (earnings and change in earnings higher is than 1% of lagged total assets);

The dependent and control variables are the same as in equation (14).

The base group are the companies that missed the benchmark. Hence, the coefficients β_1 , β_2 , β_3 in equation (15) would measure the difference in future operating performance of the companies that just met earnings benchmarks using either of the earnings management tools relative to the group which did not use earnings management and missed the benchmark.

As an additional test, model (15) will also be constructed. However, the total sample includes 1423 observations, and only 7% of those can be attributed to the group when a company met an earnings benchmark using either of earnings management tools. In contrast, samples that were used by Chen et al. (2010) and Gunny (2010) comprised over 30 000 observations. Therefore, it is expected that the results produced by model (15) would be insignificant and should not be taken into account.

Industry level analysis

In order of widen the scope of application of results, the study on the association between earnings management and performance will be extended to the industry sectors. For this purpose, there will be a used the following equation (16) with additional binary variables, that are equal to “1” if a company represents a certain industry sector, and “0” - otherwise.

$$\begin{aligned}
 ROA_IndAdj_{i,t+1,2,3} = & \beta_0 + \beta_{1.1} REM_d_{i,t} + \beta_{1.2-1.9} REM_d_{i,t} * Ind_i + \\
 & + \beta_{2.1} AEM_d_{i,t} + \beta_{2.2-2.9} AEM_d_{i,t} * Ind_i + \beta_{3.1} BOTH_d_{i,t} + \beta_{3.2-3.9} BOTH_d_{i,t} * Ind_i + \\
 & + \beta_4 ROA_IndAdj_{i,t} + \beta_5 LnAssets_{i,t} + \beta_6 Zscore_{i,t} + \beta_7 MtoB_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{16}$$

Equation (16) includes the same variables that were used in equation (14) and three groups of interaction terms that help to account for the industry effects. Ind_i is a set of binary variables that are equal to “1” if a company represents any of the sectors contained in the sample, except for the energy sector:

- 1) Energy (BASE CATEGORY)
- 2) Basic Materials
- 3) Industrials
- 4) Consumer Cyclicals
- 5) Consumer Non-cyclicals
- 6) Technology
- 7) Utilities
- 8) Real Estate
- 9) Healthcare

“Energy” sector was used as the base category. Therefore, there are 8 interaction terms for each type of earnings management: REM, AEM or BOTH. If a company is from the “Energy” sector, all interaction terms are equal to 0, and equation (16) transforms to equation (14) but shows results for “Energy” sector only.

If a company is from any other sector, for example “Basic materials”, then the effect of earnings management on performance will be represented by the sum of two coefficients: the coefficient in front of $REM_{i,t}$, $AEM_{i,t}$, or $BOTH_{i,t}$ and its respective interaction term. In the case of “Basic materials”, the effect of REM on subsequent performance would be represented by the sum of $\beta_{1.1}$ and $\beta_{1.2}$. For the sake of convenience, the results in section 2.2.2. will show the summed coefficients for each of the sectors and its respective t-statistics and p-values. The last two sectors, “Real Estate” and “Healthcare”, contain only 4 companies each. Therefore, the results obtained for these sectors cannot be reliable and will not be interpreted. However, it was decided to leave them in the model for consistency since datapoints related to these sectors were used in all other steps of research.

2.2. Research results

2.2.1. Descriptive statistics

Descriptive statistics of the data sample is presented in the Table 1 below:

Table 1. Descriptive statistics

Variable	Mean	Standart deviation	Minimum value	25th percentile	Median	75th percentile	Maximum value	No of obs.
$AEM_{i,t}$	-0.0013	0.1044	-0.3511	-0.0484	0.0038	0.0488	0.3124	1 423
$REM_{i,t}$	-0.0006	0.3318	-1.0847	-0.1895	0.0436	0.2178	0.6675	1 343
$EM_{i,t}$	-0.0021	0.3603	-1.3518	-0.2074	0.0424	0.2234	0.9799	1 343
$Assets_{i,t}$ (bln. Rub)	474.11	1 785.47	0.01	14.41	81.31	280.78	23 352.19	1 423
$LnAssets_{i,t}$	18.0267	2.0586	13.3550	16.4833	18.2138	19.4531	23.0769	1 423
$LnAssetsIndAdj_{i,t}$	-0.1682	1.9050	-5.3337	-1.4527	0.0256	1.0997	3.7808	1 423
$ROA_{i,t}$	0.0358	0.1170	-0.4736	0.0009	0.0381	0.0854	0.3557	1 423
$ROA_{IndAdj}_{i,t}$	-0.0023	0.1114	-0.5510	-0.0363	0.0000	0.0401	0.3446	1 423
$MtoB_{i,t}$	1.4703	2.4511	0.0000	0.2142	0.6045	1.5799	14.2435	1 336
$Zscore_{i,t}$	2.1057	2.1414	-4.1157	1.1010	1.7896	2.7768	11.1859	1 423
$INST_{i,t}$	0.7059	0.2412	0.0000	0.5929	0.7746	0.8867	1.0000	1 253
$Leverage_{i,t}$	0.3566	0.2750	0.0000	0.1792	0.3229	0.4772	1.5990	1 423
$Big4_{i,t}$	0.70	0.46	0	0	1	1	1	1 423
$AUD_{TEN}_{i,t}$	4.6	2.8	1.0	2.0	4.0	7.0	11.0	1 391
$NOA_{i,t-1}$	0.4098	1.5182	-1.3113	-0.3286	0.0000	0.6415	10.0830	1 338
$Cycle_{i,t}$	63	191	-475	-14	26	96	879	1 423
GDP_t	0.0096	0.0184	-0.0232	0.0022	0.0157	0.0239	0.0390	1 423
$JustMeet0_{i,t}$	0.08	0.27	0	0	0	0	1	1 423
$JustMeetLY_{i,t}$	0.10	0.30	0	0	0	0	1	1 423

The statistics, presented in table 1 was calculated for the data that was winsorized at the 1th and 99th percentiles. The maximum number of observations for any variable is 1423. It includes a 10-year period for 170 companies. The number of observations is less than 1700 (170 companies x 10 years) since not all companies prepared IFRS reports every year, especially until 2014. For some variables, for instance $MtoB_{i,t}$, the number of observations is even less since these variables are based on market data or 2-year lagged values, for which the data availability is more limited. In the result, the data sample represent unbalanced panel with minor gaps. Nevertheless, the size and quality of data is adequate to proceed with further the analysis.

The average size of total assets of the companies included in the sample is 474 billion Roubles. Such a large value is explained by the fact that all companies are publicly traded and many of them are the locomotives of the industries that they represent or even have a state-wide strategic importance. However, the range is rather wide and includes the companies whose total assets within 2010 – 2020 showed the figures as little as 0.01 billion Roubles (PJSC "Mediaholding") and as large as over 23.4 trillion Roubles (PJSC "Gazprom"). Nevertheless, such

a variation does not pose any threat to the validity of research, since all continuous variables were scaled either by total assets or by revenues.

The median Z score, an indicator of financial health, is 1.8, which is around the threshold of 1.81, the level below which companies are suspected of having financial difficulties. Hence, roughly a half of the firm years belong to a subsample of companies that had moderate financial health. 75th percentile corresponds to the value of 2.78, denoting that 25% of firm-years are associated with a solid financial performance.

The mean and median ROA of the sample is just under 4%, showing that companies generally demonstrate good profitability. Zero value is at the 25th percentile, and minimum is -47.4%, from which it can be concluded that in roughly 25% of the firm-years, companies were showing losses. Statistics for the variables *JustMeet0_{i,t}* and *JustMeetLY_{i,t}* shows that for 8% and 2.4% of the firms-years, net income was just above zero or just above last year earnings, respectively. These are the firm-years with a high probability of earnings management and are the object of the analysis under H1.

Majority of the companies are owned by the institutional owners, as average of *INST_{i,t}* is at 71%, and even at 25th percentile institutional ownership ratio is 59%. This finding is not surprising, since government holds a large stake directly or indirectly in a number of public companies, especially in the sectors of Energy, Basic Materials and Industrials.

The mean leverage coefficient is 0.36, and at 75th percentile it is less than 0.5, what demonstrates a relatively moderate debt burden of Russian companies. The average length of the operating cycle across the sample is 63 days. In more than 25% of the firm-years, companies had negative operative cycles. Closer analysis showed that these companies are mostly from utilities and technology sectors. At the same time, operating cycle can extend to as long as 879 days. Most of these companies with long cycles are the construction developers.

In around 70% of cases companies were audited by Big 4 audit firms and average audit tenure is 4.6 years. The 75th percentile is equal to 7 years, what allows to conclude that 25% of companies favored long-term relationships with their auditors, while for the other 25%, the tenure is as short as 2 years. These companies preferred to change auditors quite frequently.

Average annual real GDP change is around 1%, so that the companies generally operated in a growing economy, though GDP fell in 2015 and in 2020. Such a GDP dynamics allows to analyze earnings management under different economic conditions.

2.2.2. Empirical results

As was mentioned in the part 2.1.2. “Models and variables”, the first step is the estimation of earnings management proxies with the help of the Modified Jones and Roychowdhury models. The results are presented in table 2. All the models are statistically significant at 0.01 significance level what tells that the estimates of earnings management proxies are reliable and can be used in further steps.

Table 2. Regression results: Modified Jones and Roychowdhury models

Variables	Modified Jones	Roychowdhury Model		
	$TACC_{i,t} / A_{i,t-1}$	$PROD_{i,t} / A_{i,t-1}$	$DISX_{i,t} / A_{i,t-1}$	$CFO_{i,t} / A_{i,t-1}$
Constant		-0.2145691***	0.1145424***	0.1068654***
t-stat (p-value)		-25.21 (0.000)	20.73 (0.000)	26.38 (0.000)
$I / A_{i,t-1}$	-2061.7207	58429.198***	15171.573	-83103.065***
t-stat (p-value)	-0.22 (0.825)	2.83 (0.005)	1.15 (0.249)	-8.71 (0.000)
$(\Delta S_{i,t} - \Delta AR_{i,t}) / A_{i,t-1}$	-0.0330044*			
t-stat (p-value)	-2.17 (0.030)			
$PPE_{i,t} / A_{i,t-1}$	-0.0660765***			
t-stat (p-value)	-22.08 (0.000)			
$S_{i,t} / A_{i,t-1}$		0.918807***		-0.0047516
t-stat (p-value)		125.94 (0.000)		-1.52 (0.130)
$S_{i,t-1} / A_{i,t-1}$			0.0665098***	
t-stat (p-value)			16.18 (0.000)	
$\Delta S_{i,t} / A_{i,t-1}$		-0.1128839***		0.1064639***
t-stat (p-value)		-3.22 (0.001)		6.63 (0.000)
$\Delta S_{i,t-1} / A_{i,t-1}$		-0.1573229***		
t-stat (p-value)		-3.71 (0.000)		
Model characteristics:				
No of obs	1423	1343	1423	1423
R ²	28.4%	94.0%	15.9%	7.8%
Adjusted R ²	28.3%	94.0%	15.7%	7.6%
F-stat	188.01***	5279.24***	133.70***	39.96***
Model:	Pooled	Pooled	Pooled	Pooled

Note: *'s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Next, the results of the hypotheses tests will be presented and discussed.

H.1. Earnings benchmarks and earnings management

Burgstahler and Dichev (1997) being curious of the sharp discontinuity of the distribution of earnings around zero point, hypothesized that it might be explained by earnings management. Their hypothesis was confirmed and they proved that firms try to avoid showing losses and decreases in earnings, and use earnings management for these purposes. Similar distribution was plotted for the data sample used in this research and is shown in figure 2. As is seen from the diagram, there is unusually smaller number of firm-years with net income scaled by lagged assets in the range between -0.01 and 0, than in the range between 0 and + 0.01. The frequency at these

points departs significantly from what would be expected under normal distribution, and it cannot invoke suspicions of earnings manipulations that was possibly used to step over the zero threshold.

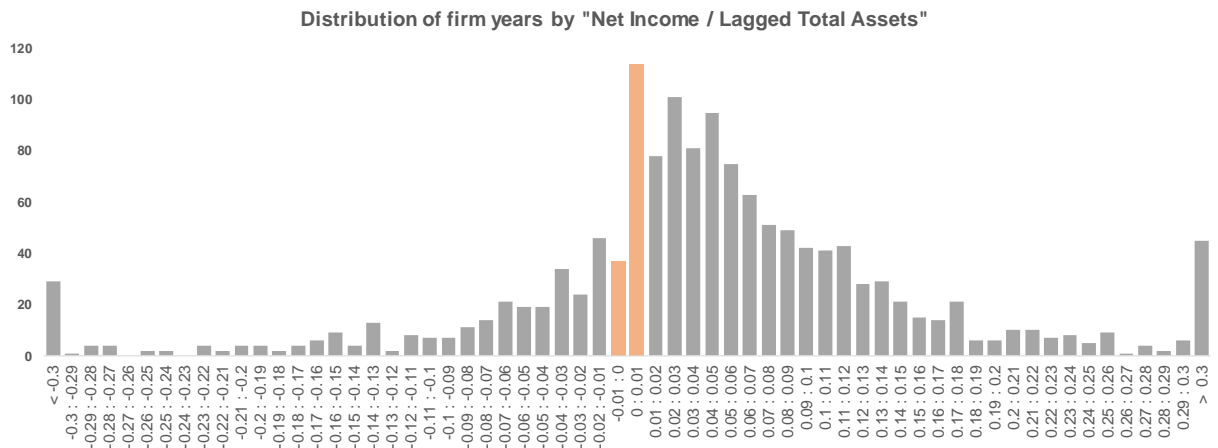


Figure 2. Histogram: firm-years by the indicator “Net income / Lagged Total Assets”

Likewise, as was proven by Burgstahler and Dichev (1997) and Gunny (2010), companies tend to avoid showing decreases in earnings and may revert to earnings management to show income at least as in previous year. Figure 3 shows the distribution similar to the one presented in figure 2, but in relation to the year-on-year change in net income:

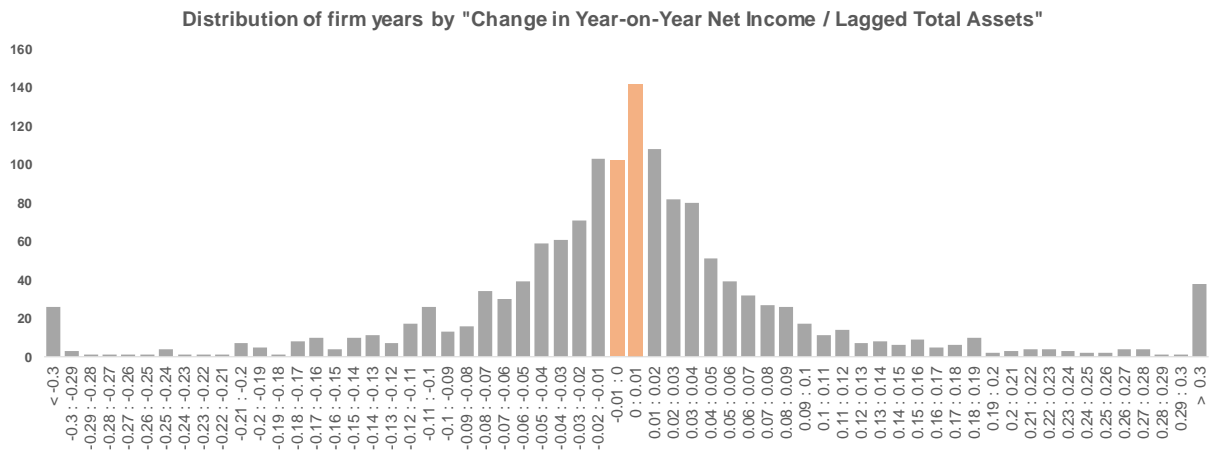


Figure 3. Histogram: firm-years by the indicator “Change in Year-on-Year Net income / Lagged Total Assets”

As figure 3 shows, the discontinuity around zero is also observed, though it is less pronounced as compared to the one seen in figure 2.

Table 3 shows the results of multivariate regressions, in which earnings management proxies are the dependent variables and $JustMeet0_{i,t}$ or $JustMeetLY_{i,t}$ are the independent binary variables that are equal to 1 if company’s earnings are just above the benchmarks but less than the

selected threshold. $JustMeet0_{i,t}$ is equal to "1" if net income divided by lagged total assets is in the range 0.00 - 0.01 and is "0" otherwise, while the binary variable $JustMeetLY_{i,t}$ is equal to "1" if year-on-year change in net income scaled by lagged total assets is higher than 0 and is less than 0.01, "0" – otherwise.

The regressions were calculated in compliance with Fama and MacBeth procedure. The respective correlation matrix is presented in appendix 2.1, which shows significant and positive correlations between $REM_{i,t}$ and $JustMeet0_{i,t}$, as well as between $AEM_{i,t}$ and $JustMeetLY_{i,t}$.

At first, zero earnings benchmark is discussed. As is seen from table 3 (Panel A), the coefficient in front of $JustMeet0_{i,t}$ is significant at 1% significance level for REM equation, and the sign is positive. Overall, the model is significant.

Table 3. Regression results: earnings benchmarks

Panel A: Zero earnings benchmark			Panel B: Last year earnings benchmark		
Variables	$REM_{i,t}$	$AEM_{i,t}$	Variables	$REM_{i,t}$	$AEM_{i,t}$
$JustMeet0_{i,t}$	0.106**	0.0189	$JustMeetLY_{i,t}$	0.0356	0.0236*
t-stat (p-value)	4.44 (0.007)	1.91 (0.114)	t-stat (p-value)	1.46 (0.205)	3.32 (0.021)
Control variables and a constant:			Control variables and a constant:		
$LnAssets_{i,t}$	-0.0032	-0.00826**	$LnAssets_{i,t}$	-0.00303	-0.00838**
t-stat (p-value)	-0.73 (0.496)	-5.69 (0.002)	t-stat (p-value)	-0.57 (0.593)	-5.25 (0.003)
$MtoB_{i,t}$	0.000651	-0.00558**	$MtoB_{i,t}$	0.00213	-0.00517*
t-stat (p-value)	0.30 (0.776)	-4.17 (0.009)	t-stat (p-value)	0.86 (0.427)	-3.82 (0.012)
$ROA_{i,t}$	-0.648**	0.595***	$ROA_{i,t}$	-0.686**	0.591***
t-stat (p-value)	-6.61 (0.001)	22.39 (0.000)	t-stat (p-value)	-5.77 (0.002)	23.11 (0.000)
Constant	0.064	0.133**	Constant	0.0655	0.134**
t-stat (p-value)	0.80 (0.458)	4.96 (0.004)	t-stat (p-value)	0.69 (0.520)	4.56 (0.006)
Model characteristics:			Model characteristics:		
No of obs	1 244	1 304	No of obs	1 181	1 238
R ²	7.3%	43.8%	R ²	7.0%	44.5%
Adjusted R ²	4.1%	41.9%	Adjusted R ²	3.6%	42.5%
F-stat	42.12***	188.6***	F-stat	38.98***	226.1***
Model:	Fama & MacBeth	Fama & MacBeth	Model:	Fama & MacBeth	Fama & MacBeth

Note: *s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Hence, firms whose earnings are just above the zero benchmark show signs of upward real earnings management as compared to the firms, whose earnings were farther away from the benchmark in either direction. It is worth to remind that the subsample did not include the firm-years with earnings just below the benchmark, i.e., whose net income after taxes scaled by lagged total assets is in the range between -0.01 and 0. Such a subsample was created in order to increase the power of the tests, since the firms that are close to meeting earnings benchmarks may still have an incentive to manipulate earnings. Similar subsample was created for the test of last year earnings benchmark.

Interestingly, according to the results from Panel B (table 3), companies that just meet last year earnings benchmark tend to manipulate with accruals (*JustMeet0_{it}* is significant at 5% in AEM equation), but no significant relationship was found for real earnings management. The study of factors behind the choice will be discussed next, but what is seen at this point is that companies, that struggle to show positive earnings and have financial difficulties, opt for real earnings management, while companies, that just need to show results at least as in previous year, show higher levels of accrual-based earnings management.

Nevertheless, the results show that companies, whose earnings are just above the zero and last year earnings benchmarks demonstrate higher levels of earnings management as compared to companies whose earnings were farther from the benchmarks. Similar results were obtained by Burgstahler and Dichev (1997), Gunny (2010), Roychowdhury (2006) and Zang (2012). Another valuable outcome of the obtained result is that the presence of earnings management was established. Both Modified Jones and Roychowdhury models provided adequate estimates for earnings management proxies, and hence it is possible to proceed with further steps.

Both hypothesis H1.1. and H1.2. are accepted.

H1.1.: “Firms that just meet zero earnings benchmark (earnings are in range 0 – 1% of lagged total assets) exhibit evidence of earnings management” – “Accepted”

H1.2.: “Firms that just meet last year’s earnings benchmark (year-on-year change in earnings is in range 0 – 1% of lagged total assets) exhibit evidence of earnings management” – “Accepted”

H.2. Factors affecting the choice of an earnings management strategy

The hypotheses 2.1 – 2.6., each related to the factors that might influence on the choice between real and accrual-based earnings management, were verified using simultaneous multivariate regression models, whose results are presented in table 4. Based on the results of the F-test, the Breusch-Pagan test and the Hausman test presented in the appendix 3, regressions with fixed effects were selected for both REM and AEM equations. The correlations matrix depicting the relationship between the variables is presented in the appendix 2.2. The variables were checked for the multicollinearity with the help of Variance Inflation Factors (VIF), for which the commonly accepted threshold of 10 was applied. Strong multicollinearity was not revealed. Both regression models shown in table 4 are significant at 0.001 significance level.

Table 4. Regression results: testing hypotheses H2.1 – H2.6, 3

Variables	Hypothesis	Pred. sign	$REM_{i,t}$	Pred. sign	$AEM_{i,t}$
$Zscore_{i,t}$ t-stat (p-value)	H2.3.	-	-0.00842* -2.16 (0.032)	+	0.004 1.25 (0.214)
$INST_{i,t}$ t-stat (p-value)	H2.4.	-	0.00916 0.81 (0.417)	+	-0.00787 -0.93 (0.354)
$Big4_{i,t}$ t-stat (p-value)	H2.1.	+	0.00341 0.42 (0.676)	-	0.00101 0.21 (0.833)
$AUD_TEN_{i,t}$ t-stat (p-value)	H2.1.	+	-0.00145 -0.91 (0.366)	-	-0.000284 -0.32 (0.747)
CGC_t t-stat (p-value)	H2.5.	+	-0.0104* -2.09 (0.038)	-	0.0115*** 3.59 (0.000)
$NOA_{i,t-1}$ t-stat (p-value)	H2.2.	+	0.0170* 2.58 (0.011)	-	-0.0178*** -3.86 (0.000)
$Cycle_{i,t}$ t-stat (p-value)	H2.2.	-	0.000105* 2.03 (0.044)	+	-0.0000685* -2.44 (0.016)
GDP_t t-stat (p-value)	H2.6.	-	-0.218** -2.71 (0.007)	+	0.280*** 4.89 (0.000)
$UnexpectedREM_{i,t}$ t-stat (p-value)	H3			-	-0.471** -2.93 (0.004)
Control variables and a constant:					
$ROA_{i,t}$ t-stat (p-value)			0.217* 2.43 (0.016)		0.879*** 14.58 (0.000)
$LnAssetsIndAdj_{i,t}$ t-stat (p-value)			0.0410*** 3.63 (0.000)		-0.0289*** -4.00 (0.000)
$MtoB_{i,t}$ t-stat (p-value)			0.000000116 0.00 (1.000)		0.000781 0.87 (0.386)
$Leverage_{i,t}$ t-stat (p-value)			-0.0599 -1.00 (0.317)		0.0453 1.39 (0.165)
$IncomePreEM_{i,t}$ t-stat (p-value)			-0.691*** -29.64 (0.000)		
$PredREM_{i,t}$ t-stat (p-value)					0.378*** 13.40 (0.000)
Constant t-stat (p-value)			0.0490* 2.23 (0.027)		-0.0477** -3.15 (0.002)
Model characteristics:					
No of obs			1 160		1 160
R ²			87.5%		84.2%
Adjusted R ²			87.3%		84.0%
F-stat			252***		223.8***
Model:			Fixed-effects		Fixed-effects

Note: *'s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

According to the first hypothesis, **H 2.1, firms facing greater scrutiny from auditors have a higher level of Real earnings management and a lower level of Accrual-based earnings management.** The degree of scrutiny from auditors is operationalized via the independent variables $Big4_{i,t}$ and $AUD_TEN_{i,t}$. Both of the coefficients are not significant in either REM or AEM equation, hence **the hypothesis H 2.1 cannot be accepted nor rejected.** The possible

explanation is that in 70% of the firm-years, companies were audited by Big4 audit firms. While in the other 30% of cases, companies were audited by non Big4 audit firms, which also might provide high quality services. For example, in 2020, 15% of the companies were audited by Crowe, Grant Thornton and Yunikon. Crowe and Grant Thornton, though not part of a Big4, also belong to global networks with headquarters in USA and UK respectively. Yunikon is the largest national audit firm founded in 1989 that possesses enough expertise to produce high quality audit.

As for the audit tenure, the effect might be bidirectional. On one hand, longer tenure allows auditors to become more familiar with the accounts of their clients, and hence not to miss earnings management attempts. On the other hand, there is a higher probability of collusion, since the relationship between the representatives of a client and an auditor become closer. Besides, there is a fierce competition between the audit firms that try to maintain their contracts with clients and thus might show some flexibility. Highly likely, because both effects compensated each other, the net result turned out to be ambiguous.

The next hypothesis, **H 2.2**, proposes that *firms with higher accounting flexibility have a lower level of Real earnings management and a higher level of Accrual-based earnings management*. Accounting flexibility is measured with two variables $NOA_{i,t-1}$ and $Cycle_{i,t}$. The coefficient in front of $NOA_{i,t-1}$ is significant in both equations and the signs are as expected: positive in REM equation and negative in AEM equation. Therefore, it can be concluded that companies with inflated net operating assets due to the accrual-based earnings management used in previous accounting periods, are constrained to use accrual-based earnings management and have to revert to real earnings management.

The operating cycle, $Cycle_{i,t}$, is significant in both models, but the signs turned out to be opposite to the expected ones. The logic behind hypothesis was that companies with longer operating cycles, have inherently higher accruals, that can mask accrual-based earnings management. Thus, managers at such companies would prefer accrual-based earnings management over real earnings management, while opposite would be true for real earnings management. The possible explanation for the unexpected results might be that companies with longer operating cycles also have higher accounts receivables and inventory. Hence, these companies have large accruals and managers might refuse to inflate them further, and therefore they opt for real earnings management. In essence, longer cycle limits accounting flexibility rather than widens it, contrary to the findings by Zang (2012). Considering all the evidence observed, **the hypothesis H2.2. is accepted**: accounting flexibility is a factor of choice between real and accrual-based earnings management, and managers having lower accounting flexibility prefer real over accrual-based earnings management.

H 2.3 proposes that ***firms with a better financial health have a lower level of Real earnings management and a higher level of Accrual-based earnings management.*** Managers at the companies with a better financial health would avoid to deviate from normal course of business and interfere with real operations. Besides, if a company struggles with financial difficulties, in fear of accrual reversals and snowballing effect, managers might prefer real earnings management over accrual-based earnings management.

The variable $Zscore_{i,t}$, through which financial health was operationalized, is not significant in AEM equation, but significant in REM equation. The sign is positive, in line with the expectations. Hence, as results show, managers at the companies with better financial health apply real earnings management to lesser extent as compared to the financially weaker firms.

The possible interpretation for the obtained result is that real earnings management, especially cutting R&D expenditures or rejecting positive NPV projects might have negative implications for the firm value. Hence, if a company prospers, managers might refuse to interfere with operations and slow down the company growth just to dress up financial statements. And the other way round, when a company experiences financial difficulties, managers would rather sequester the budget than to delay the recognition of expenditures that has already been incurred and need to be recorded in the end. The operational environment also plays a crucial role. Zang (2012) tested the hypothesis on the US data sample, where managers would face serious penalty if their wrongdoing is revealed, particularly post SOX. In Russia possible retributions are not so severe, and managers might refuse to sacrifice firm value to show better short-term results, when they can do so with accruals. Therefore, since $Zscore_{i,t}$ is significant in REM equation but not significant in AEM equation, **the hypothesis H2.3. is partially accepted.**

According to *H 2.4*, ***firms with higher institutional ownership have a lower level of Real earnings management and a higher level of Accrual-based earnings management*** because of the additional monitoring by institutional investors. As regression results (table 3) show, $INST_{i,t}$ is not significant in both equations, what denotes that institutional ownership is not a factor that managers take into account when they decide on the earnings management strategy. The possible reason for insignificant association between earnings management and institutional ownerships might revolve around the fact that the average stake owned by the institutional owners for this data sample is around 70%. Companies are largely homogenous in regards to institutional ownership what might be the reason for such a little variation in the behavior of managers when institutional ownership is considered. Therefore, **the hypothesis H2.4. cannot be accepted nor rejected.**

The focus of the hypothesis **H 2.5** is on the influence of general environment in which monitoring practices tightened after the acceptance of *Corporate Governance Code (CGC) in Russia in 2014*. It was hypothesized that *Code led to a higher usage of Real earnings management and a lower usage of Accrual-based earnings management*. The variable CGC_t is significant in both equations, but the signs contradict the expectations. Other things being equal, after the CGC, real earnings management fell, but accrual-based earnings management increased. However, the opposite effect was expected following the findings of Cohen et al. (2008) and Zang (2012), who investigated the influence of Sarbanes-Oxley Act (SOX) on earnings management. The reason for the difference in findings might be in the different goals of CGC and SOX. SOX drastically tightened the liability of managers for presenting faulty accounting reports, and hence managers switched from easily detectible accrual-based earnings management to real earnings management, even at the expense of company shareholders. The goal of CGC is different and is about the improvement of corporate governance mechanisms in public companies. Given that the end goal of corporate governance is the effective protection of shareholders' interests, the main of which is in wealth maximization, it seems logical that CGC helped to shrink real earnings management as compared to accrual-based earnings management. **The hypothesis H2.5. was rejected.**

The final factor that was investigated is the economic cycle and its association with earnings management. Hypothesis **H 2.6** proposes that *when economic conditions are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management*. The variable GDP_t (relative change in real GDP in constant prices in Russia) is significant in both equations and signs are as expected. Hence, other things being equal, when economy is growing, companies prefer to use accrual-based earnings management. The possible explanation is that managers expect accruals reversals to be offset by the rising earnings. On the contrary, in a growing economy, managers prefer not to apply real earnings management that may slow down business growth. **The hypothesis H2.6. was accepted.**

It is important to notice that the signs in front of all variables that showed significance are opposite in both REM and AEM equations. It invokes a conclusion that both real and accrual-based earnings management have a substitutive nature and any factor that positively influences on real earnings management, have an opposite influence on accrual-based earnings management.

The summary of results is presented in table 5 below.

Table 5. Summary of the tests for hypotheses 2.1 – 2.6

H 2.1: “Other things being equal, firms facing greater scrutiny from auditors have a higher level of Real earnings management and a lower level of Accrual-based earnings management.”	Cannot be accepted nor rejected
H 2.2: “Other things being equal, firms with lower accounting flexibility have a higher level of Real earnings management and a lower level of Accrual-based earnings management.”	Accepted
H 2.3: “Other things being equal, firms with a better financial health have a lower level of Real earnings management and a higher level of Accrual-based earnings management”	Partially accepted (influence on REM only is observed)
H 2.4: “Other things being equal, firms with higher institutional ownership have a higher level of Accrual-based earnings management and a lower level of Real earnings management.”	Cannot be accepted nor rejected
H 2.5: “Other things being equal, acceptance of Corporate Governance Code in Russia in 2014 led to the lower usage of Accrual-based earnings management and a higher usage of Real earnings management.”	Rejected
H 2.6: “Other things being equal, when economic conditions are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management.”	Accepted

H.3. Timing of Real and Accrual-based earnings management

The next issue that was studied is the order in which the two earnings management strategies are used. Based on the outcomes of previous research it was hypothesized in H3 that **“Real earnings management and Accrual-based earnings management are used sequentially; managers adjust the amount of Accrual-based earnings management depending on the outcome of Real earnings management”**.

The hypothesis 3 was tested using the same system of equations, that were used to test the hypotheses 2.1 – 2.6. As the results presented in table 4 show, the coefficient in front of the variable $UnexpectedREM_{i,t}$ is significant and negative. The result suggests that managers apply real earnings management first, and then after the fiscal year end, when the financial result can be reliably estimated, they apply accrual-based earnings management to fine tune earnings. It is important to note that the sequence of real and accrual-based earnings management refers to the same financial year, and that is why dependent variables and $UnexpectedREM_{i,t}$ have the same time index t . It is presumed that managers apply accrual-based earnings management within four months, that they have to prepare, to audit and to publish an IFRS report.

It is also possible that a decision on the earnings management strategies is taken at a single point of time, and $UnexpectedREM_{i,t}$ would also be significant and negative in this case. As an additional check, the Hausman test was performed. The results of the Hausman test are presented

in table 6. Conceptually, these are the results of regressions when both $REM_{i,t}$ and $AEM_{i,t}$ were cross regressed on $AEM_{i,t}$ and $REM_{i,t}$, the instruments of $AEM_{i,t}$ and $REM_{i,t}$, and exogenous variables (the factors that were investigated in H2.1 – 2.6.). As can be seen from the table, $AEM_{i,t}$ is not significant in the $REM_{i,t}$ equation, while $REM_{i,t}$ is significant in AEM equation. It means that AEM is affected by REM, but REM is not affected by AEM. The outcome supports the hypothesis 3.

Interestingly, as correlation matrix (appendix 2.2) shows, the simple correlation between $REM_{i,t}$ and $AEM_{i,t}$ is positive and significant, contrary to the results obtained above. The same paradoxical observation was also witnessed and explained by Cohen and Zarowin (2010) and Zang (2012) . The reason for such inconsistency is that when managers aim to manipulate earnings, they will do so using both techniques. In effect, both REM and AEM are positively correlated with the stimulus to move earnings either up or down, so that correlation between them also becomes positive. Therefore, to discern the real association between REM and AEM, both equations (10) and (11) contained the control variables to account for extent of desired earnings management activities. In summary, obtained evidence allows **to accept the hypothesis H3.**

Table 6. Regression results: Hausman test on the sequence of earnings management strategies

Variables	<i>REM</i> _{<i>i,t</i>}	<i>AEM</i> _{<i>i,t</i>}
<i>AEM</i> _{<i>i,t</i>}	0.149	
t-stat (p-value)	1.48 (0.141)	
<i>PredAEM</i> _{<i>i,t</i>} (Instrument for AEM)	-2.343***	
t-stat (p-value)	-9.58 (0.000)	
<i>REM</i> _{<i>i,t</i>}		1.043***
t-stat (p-value)		5.62 (0.000)
<i>PredREM</i> _{<i>i,t</i>} (Instrument for REM)		-0.659***
t-stat (p-value)		-3.55 (0.001)
Exogenous variables:		
<i>Zscore</i> _{<i>i,t</i>}	-0.0111***	0.00536*
t-stat (p-value)	-5.18 (0.000)	2.12 (0.035)
<i>INST</i> _{<i>i,t</i>}	0.00759	-0.00894
t-stat (p-value)	1.33 (0.186)	-1.10 (0.275)
<i>Leverage</i> _{<i>i,t</i>}	-0.0521*	0.0610**
t-stat (p-value)	-2.16 (0.033)	2.79 (0.006)
<i>Big4</i> _{<i>i,t</i>}	0.0125**	-0.00196
t-stat (p-value)	3.29 (0.001)	-0.44 (0.660)
<i>AUD_TEN</i> _{<i>i,t</i>}	-0.00385***	0.00012
t-stat (p-value)	-7.37 (0.000)	0.15 (0.881)
<i>CGC</i> _{<i>t</i>}	0.00948***	0.0123***
t-stat (p-value)	4.28 (0.000)	4.23 (0.000)
<i>NOA</i> _{<i>i,t-1</i>}	-0.00296	-0.0233***
t-stat (p-value)	-0.94 (0.347)	-10.69 (0.000)
<i>Cycle</i> _{<i>i,t</i>}	0.0000722*	-0.000105***
t-stat (p-value)	2.01 (0.046)	-5.90 (0.000)
<i>GDP</i> _{<i>t</i>}	0.280***	0.271***
t-stat (p-value)	6.17 (0.000)	5.28 (0.000)
<i>ROA</i> _{<i>i,t</i>}	2.230***	0.839***
t-stat (p-value)	12.59 (0.000)	17.76 (0.000)
<i>LnAssetsIndAdj</i> _{<i>i,t</i>}	0.0173***	-0.0350***
t-stat (p-value)	4.47 (0.000)	-6.13 (0.000)
<i>MtoB</i> _{<i>i,t</i>}	0.00227**	0.000333
t-stat (p-value)	2.76 (0.007)	0.34 (0.735)
<i>IncomePreEM</i> _{<i>i,t</i>}	-1.221***	
t-stat (p-value)	-30.71 (0.000)	
<i>UnexpectedREM</i> _{<i>i,t</i>}		-1.673***
t-stat (p-value)		-8.20 (0.000)
<i>Constant</i>	-0.00406	-0.0479***
t-stat (p-value)	-0.32 (0.747)	-3.95 (0.000)
Model characteristics:		
No of obs	1 160	1 160
R ²	97.5%	87.3%
Adjusted R ²	97.4%	87.2%
F-stat	1807.6***	338***
Model:	Fixed-effects	Fixed-effects

Note: *'s indicate the significance levels. ****p* < 0.001, ***p* < 0.01, **p* < 0.05

H.4. Earnings management and corporate performance

Hypothesis 4 was verified using multivariate regression models, whose results are presented in tables 7 and 8. Table 7 demonstrates the regression results when 80th percentile was selected in order to determine the independent binary variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$, while table 8 presents analogous results but for the case of the 67th percentile. Based on the results of the F-test, the Breusch-Pagan test and the Hausman test presented in the appendix 3, regressions with fixed effects were selected. The correlations matrix demonstrating the relationship between the variables is presented in the appendix 2.3. The variables were checked for the multicollinearity with the help of Variance Inflation Factors (VIF), for which the commonly accepted threshold of 10 was applied. Strong multicollinearity was not revealed.

All three models for dependent variables $ROA_{IndAdj_{i,t+1}}$, $ROA_{IndAdj_{i,t+2}}$, and $ROA_{IndAdj_{i,t+3}}$ are significant at 0.001, 0.05 and 0.05 significance levels respectively (table 7).

According to the regression results presented in table 7 (80th percentile threshold), there is a significant and negative relationship between real earnings management and next year company performance, measured with return on assets (ROA) adjusted for industry median. The coefficient in front of $REM_{d_{i,t}}$ can be interpreted as follows: companies, for which real earnings management proxy was above the 80th percentile in the industry-year REM distribution, had the next year industry-adjusted ROA lower by 0.0216 as compared to industry-adjusted ROA of the companies which were below the 80th percentile in REM distributions. Industry-adjusted ROA can be interpreted as the relative position in the industry relative to peers. For subsequent periods ($t+2$, $t+3$), no significant relationship was revealed.

The variables $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$ are not significant, suggesting that there is no significant association between accrual-based earnings management and future performance.

Table 7. Regression results: earnings management and ROA.
80th percentile threshold

Variables	<i>ROA_IndAdj</i> _{<i>i,t+1</i>}	<i>ROA_IndAdj</i> _{<i>i,t+2</i>}	<i>ROA_IndAdj</i> _{<i>i,t+3</i>}
<i>REM_d</i> _{<i>i,t</i>}	-0.0216*	-0.0204	0.00503
t-stat (p-value)	-2.34 (0.021)	-1.71 (0.090)	0.51 (0.611)
<i>AEM_d</i> _{<i>i,t</i>}	-0.0115	-0.00543	-0.0153
t-stat (p-value)	-1.18 (0.241)	-0.54 (0.590)	-1.77 (0.078)
<i>BOTH_d</i> _{<i>i,t</i>}	-0.00889	0.0061	0.0127
t-stat (p-value)	-0.82 (0.416)	0.64 (0.523)	0.89 (0.375)
Control variables and a constant:			
<i>ROA_IndAdj</i> _{<i>i,t</i>}	0.153*	-0.0934	0.0839
t-stat (p-value)	2.54 (0.012)	-1.38 (0.169)	1.51 (0.133)
<i>LnAssets</i> _{<i>i,t</i>}	-0.0349**	-0.0370*	-0.0439**
t-stat (p-value)	-2.63 (0.009)	-2.07 (0.040)	-3.11 (0.002)
<i>Zscore</i> _{<i>i,t</i>}	0.00631	0.002	-0.0115*
t-stat (p-value)	1.11 (0.269)	0.32 (0.752)	-2.07 (0.041)
<i>MtoB</i> _{<i>i,t</i>}	0.00315	0.00172	0.00398
t-stat (p-value)	1.27 (0.207)	0.69 (0.494)	1.90 (0.059)
<i>Constant</i>	0.614*	0.660*	0.807**
t-stat (p-value)	2.54 (0.012)	2.01 (0.046)	3.13 (0.002)
Model characteristics:			
No of obs	1 168	1 006	856
R ²	7.0%	3.1%	3.1%
Adjusted R ²	6.5%	2.4%	2.3%
F-stat	8.167***	2.576*	2.168*
Model:	Fixed effects	Fixed effects	Fixed effects

Note: *'s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

As can be seen from the regression results presented in table 8 (67th percentile threshold), the variable *REM_d*_{*i,t*} remains significant for *ROA_IndAdj*_{*i,t+1*} and also it became significant in *ROA_IndAdj*_{*i,t+2*} equation. In terms of the association between real earnings management and one year ahead performance, results are robust to the selection of a threshold. Therefore, **it can be concluded that real earnings management negatively affects subsequent profitability, at least in the year next to the period when real earnings management was applied.**

Using the 67th percentile, the variable *AEM_d*_{*i,t*} becomes significant with a negative sign. The magnitude of a coefficient is not statistically different from the coefficient in front of *REM_d*_{*i,t*}. It implies that both real and accrual-based earnings management have a negative influence on subsequent corporate performance and that the magnitude of the influence is not materially different between the two earnings management strategies. However, since this result was not confirmed using the 80th percentile, **no conclusion can be made with regards to accrual-based earnings management.**

Table 8 Regression results: earnings management and ROA.
67th percentile threshold

Variables	<i>ROA_IndAdj</i> _{<i>i,t+1</i>}	<i>ROA_IndAdj</i> _{<i>i,t+2</i>}	<i>ROA_IndAdj</i> _{<i>i,t+3</i>}
<i>REM_d</i> _{<i>i,t</i>}	-0.0218*	-0.0270*	-0.0044
t-stat (p-value)	-2.20 (0.030)	-2.04 (0.043)	-0.33 (0.739)
<i>AEM_d</i> _{<i>i,t</i>}	-0.0203**	-0.00945	-0.00763
t-stat (p-value)	-2.69 (0.008)	-1.07 (0.285)	-0.81 (0.419)
<i>BOTH_d</i> _{<i>i,t</i>}	-0.0143	-0.0158	-0.00545
t-stat (p-value)	-1.40 (0.163)	-1.53 (0.129)	-0.47 (0.637)
Control variables and a constant:			
<i>ROA_IndAdj</i> _{<i>i,t</i>}	0.166**	-0.0875	0.0711
t-stat (p-value)	2.93 (0.004)	-1.27 (0.205)	1.20 (0.233)
<i>LnAssets</i> _{<i>i,t</i>}	-0.0344*	-0.0364*	-0.0433**
t-stat (p-value)	-2.60 (0.010)	-2.02 (0.045)	-2.98 (0.003)
<i>Zscore</i> _{<i>i,t</i>}	0.00618	0.00207	-0.011
t-stat (p-value)	1.12 (0.265)	0.34 (0.732)	-1.97 (0.050)
<i>MtoB</i> _{<i>i,t</i>}	0.0032	0.00167	0.00395
t-stat (p-value)	1.26 (0.208)	0.68 (0.499)	1.86 (0.065)
<i>Constant</i>	0.610*	0.655*	0.798**
t-stat (p-value)	2.55 (0.012)	2.00 (0.047)	3.03 (0.003)
Model characteristics:			
No of obs	1 168	1 006	856
R ²	7.3%	3.3%	2.8%
Adjusted R ²	6.7%	2.6%	2.0%
F-stat	11.59***	3.715**	1.915(NS)
Model:	Fixed effects	Fixed effects	Fixed effects

Note: *'s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

NS - not significant

The obtained results in regards to real earnings management are in line with the set forth hypothesis and economic theory. As discussed in the first chapter, the most widely used real earnings management techniques are manipulation with sales, provision of discounts / lenient credit terms, and cutting of marketing, R&D and SG&A expenses. The chance that such techniques of earnings management will have no effect on subsequent performance is rather remote. For instance, cutting marketing or R&D expenses now will surely boost short term earnings, but it will have its implications in a long-run when a company losses competition selling an outdated product or with insufficient advertising. Similar conclusion was achieved by Cohen and Zarowin (2010), Legget et al. (2016) and Tabassum et al. (2015). Thus, it can be concluded that real earnings management in Russia is of opportunistic nature, and not informational as per signaling theory.

The results on the accrual earnings management are less obvious. If 80th percentile threshold is selected, there is no significant association between accrual-based earnings management and performance. However, in the case of 67th percentile, the association becomes significant and negative. Besides, the magnitude of the coefficient in front of *AEM_d*_{*i,t*} is statistically not different from the magnitude of the coefficient in front of *REM_d*_{*i,t*}.

One explanation for this results might be in different reaction of profitability to accrual-based earnings management for different firm-years. The association is significant for the firm-years between the 67th percentile and the 80th percentile in AEM distribution, but the significance disappears above the 80th percentile. This difference might be explained by the patterns in which accrual-based earnings management is used. The peculiar feature of accrual-based earnings management is a reversal of accruals. For example, if the recognition of operational expenditures is postponed, in the next accounting period the double amount will have to recorded, what might have a drag on earnings. However, if actual earnings grow and this growth covers accruals reversals, and / or if the magnitude of accrual-based earnings management is stable over the years, so that comparable amount of earnings is recognized ahead, results should not deteriorate significantly due to accruals reversals. It might explain the difference in the results for different thresholds. For firm-years above the 80th percentile, the level of accrual-earnings management is higher than for firm-years above the 67th percentile. Probably, at these companies, accrual-based earnings management is used on the regular basis or managers use it only when they are sure that future earnings growth would cover any reversals. However, for companies with a lower level of discretionary accruals (below 80th percentile but above 67th), this strategy may be used sporadically so that next year results become sensitive to reversals.

Nevertheless, this issue needs a more thorough analysis. Results in other publications in regards to accrual-earnings management are contradictory as well. Chen et al. (2010) found a statistically insignificant association between accrual-based earnings management and future performance, however Cohen and Zarowin (2010) showed that earnings manipulation around seasoned equity offerings (SEO) using accrual earnings management caused a decline in post-SEO company performance but it was less severe as compared to real earnings management.

As was discussed in section 2.1.2., as an additional test and for the sake of comparability with other publications, regression models were recalculated with independent variables that account not only for earnings management, but also for the state of meeting earnings benchmarks. However, as expected, the models turned out to be much weaker, and $AEM_{d_{i,t}}/REM_{d_{i,t}}$ variables were insignificant with p-values close to 1. The reason for such an outcome is a very small size of the subsample of firm-years when benchmarks were presumed to be met with the help of earnings management.

In summary, **the hypothesis H4 is partially accepted.**

Industry level analysis

Table 9 shows regression results on the association between earnings management and performance with a split for industry sectors.

Table 9. Regression results: earnings management and ROA.
Industry level analysis

Panel A

Variables	<i>ROA_IndAdj</i> <i>i,t+1</i> 80th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 67th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 80th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 67th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 80th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 67th percentile
	<i>REM_d_{i,t}</i>		<i>AEM_d_{i,t}</i>		<i>BOTH_d_{i,t}</i>	
<i>Ind_i</i> [1.Energy]	-0.0973*	-0.0653	-0.0337	-0.0442*	-0.013	0.0051
t-stat (p-value)	-2.35 (0.020)	-1.69 (0.092)	-1.74 (0.083)	-2.26 (0.025)	-0.47 (0.638)	0.18 (0.854)
<i>Ind_i</i> [2.Basic_Materials]	-0.0337**	-0.0386*	-0.0026	-0.0257*	-0.0126	-0.038*
t-stat (p-value)	-2.66 (0.009)	-2.06 (0.041)	-0.27 (0.786)	-2.26 (0.025)	-1.26 (0.210)	-2.17 (0.032)
<i>Ind_i</i> [3.Industrials]	0.0145	-0.0319	0.0073	-0.052*	0.0249	0.0012
t-stat (p-value)	0.75 (0.452)	-0.84 (0.400)	0.19 (0.846)	-2.07 (0.040)	1.21 (0.229)	0.04 (0.970)
<i>Ind_i</i> [4.Consumer_Cyclicals]	0.0311	0.0508	0.0146	0.022	0.0441	0.0407
t-stat (p-value)	1.12 (0.263)	0.97 (0.334)	0.31 (0.753)	0.56 (0.577)	1.79 (0.075)	1.17 (0.244)
<i>Ind_i</i> [5.Consumer_Non-Cyclicals]	-0.0525	0.0099	-0.0345**	-0.0174	-0.0785	-0.0529
t-stat (p-value)	-1.72 (0.087)	0.53 (0.597)	-3.20 (0.002)	-1.46 (0.147)	-1.72 (0.087)	-1.26 (0.211)
<i>Ind_i</i> [6.Technology]	-0.0075	-0.0149	0.0034	-0.0193	-0.0114	-0.0484
t-stat (p-value)	-0.48 (0.629)	-0.92 (0.359)	0.15 (0.877)	-1.64 (0.104)	-1.04 (0.300)	-1.71 (0.089)
<i>Ind_i</i> [7.Utilities]	-0.0147	-0.027*	-0.0297	-0.0192	-0.0209	-0.0241*
t-stat (p-value)	-0.97 (0.332)	-2.11 (0.036)	-1.97 (0.050)	-1.42 (0.157)	-1.08 (0.280)	-2.03 (0.044)
<i>Ind_i</i> [8.Real_Estate]	-0.0386***	-0.0274**	0.0116***	0.0187***	0.0141	0.0344**
t-stat (p-value)	-3.93 (0.000)	-2.93 (0.004)	3.68 (0.000)	4.54 (0.000)	1.00 (0.320)	3.26 (0.001)
<i>Ind_i</i> [9.Healthcare]	-0.027**	-0.0245	0.0162*	0.0269	0.0463*	0.0639***
t-stat (p-value)	-2.78 (0.006)	-0.58 (0.561)	2.38 (0.018)	1.71 (0.089)	2.21 (0.029)	3.76 (0.000)

Panel B

Variables	<i>ROA_IndAdj</i> <i>i,t+1</i> 80th percentile	<i>ROA_IndAdj</i> <i>i,t+1</i> 67th percentile
Control variables and a constant:		
<i>ROA_IndAdj_{i,t}</i>	0.147*	0.178**
t-stat (p-value)	2.23 (0.027)	3.14 (0.002)
<i>LnAssets_{i,t}</i>	-0.0348**	-0.0355**
t-stat (p-value)	-2.80 (0.006)	-2.84 (0.005)
<i>Zscore_{i,t}</i>	0.0045	0.0039
t-stat (p-value)	0.82 (0.413)	0.71 (0.482)
<i>MtoB_{i,t}</i>	0.0032	0.00339
t-stat (p-value)	1.30 (0.196)	1.36 (0.177)
<i>Constant</i>	0.617**	0.636**
t-stat (p-value)	2.72 (0.007)	2.81 (0.006)
Model characteristics:		
No of obs	1 168	1 168
R ²	9.1%	9.8%
Adjusted R ²	6.6%	7.4%
F-stat	3.14***	3.43***
Model:	Fixed	Fixed

Note: *s indicate the significance levels. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Panel A demonstrates the coefficients of independent variables and their significance characteristics, while panel B shows the coefficients for control variables as well as overall model parameters. The results are presented for two models. In the first model, variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$ were determined using the 80th percentile, while for the second model they were determined using the 67th percentile. As was discussed in the description of methodology (section 2.1.2.), the results for the 80th percentile have a priority over the results for the 67th percentile, and the conclusion was made only if coefficients are significant for the 80th percentile.

The results are presented for one year ahead profitability ($ROA_{IndAdj_{i,t+1}}$) since for other periods ($t+2$ and $t+3$) the models are not significant. In Panel A the results are shown in three sub columns: $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$ separately for each type of earnings management. The rows represent the industry sectors, and the coefficients reflect the association between corresponding type of earnings management and one-year ahead performance particularly for that sector. The latter two sectors (Real Estate and Healthcare) contain only 4 companies each, and hence, their results will not be considered notwithstanding the significance of coefficients.

As can be seen from the $REM_{d_{i,t}}$ sub column, there is a negative relationship between real earnings management and performance for “Energy” and “Basic materials” sectors. “Energy” sector comprises 18 companies from oil & gas and coal industries, while “Basic Materials” sector comprises 35 companies that are in the business of mining and processing of mineral resources (e.g., iron, steel, gold, aluminum and other chemicals). These two sectors together represent a third of the whole sample. For “Basic Materials” sector the coefficient is significant for both 80th and 67th percentiles. For “Energy” sector the coefficient is significant at 5% significance level for the 80th percentile, and at 10% significance level for the 67th percentile. The magnitude of coefficient is higher for the 80th percentile. This observation can denote that, in the case of “Energy” sector, real earnings management becomes detrimental to subsequent performance when used at high levels. Also, the magnitudes of coefficients for “Energy” sector is nearly three times higher than the one for “Basic materials”. It means that “Energy” companies’ performance is more sensitive to real earnings management.

From the $AEM_{d_{i,t}}$ sub column, it can be seen that there is a negative relationship between accrual-based earnings management and performance for “Consumer Non-Cyclicals” sector. This sector comprises 16 companies that produce and resell non-durable consumers goods. For other sectors, the association between accrual-based earnings management and performance is not significant for the 80th percentile. In the case of the 67th percentile, the coefficients are negative and significant for “Energy”, “Basic Materials” and “Industrials” sectors. However, at higher

levels of accrual-based earnings management, above the 80th percentile, the significance disappears, what does not allow to make a conclusion on the association between $AEM_{d_{i,t}}$ and performance for these sectors. Generally, these results denote that companies from “Consumer Non-Cyclicals” sector are the most sensitive to accruals reversal and their performance deteriorates due to the accrual-based earnings management to greater extent as compared to other sectors.

For the case of firm-years, for which both accrual-based and real earnings management were above the 80th percentile, no statistically significant coefficients were revealed.

2.4. Discussion of results and managerial implications

The results of hypotheses tests are summarized in table 10 and will be discussed next via the prism of managerial implications.

Table 10. Summary of results

Hypotheses	Results
Earnings benchmarks and earnings management	
H1.1.: “Firms that just meet earnings zero earnings benchmark (earnings are in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”	Accepted
H1.2.: “Firms that just meet last year’s earnings benchmark (year-on-year change in earnings is in range 0 – 1% of lagged total assets) exhibit evidence of earnings management”	Accepted
Factors affecting the choice of an earnings management strategy	
H 2.1: “Other things being equal, firms facing greater <i>scrutiny from auditors</i> have a higher level of Real earnings management and a lower level of Accrual-based earnings management”	Cannot be accepted nor rejected
H 2.2: “Other things being equal, firms with higher <i>accounting flexibility</i> have a lower level of Real earnings management and a higher level of Accrual-based earnings management”	Accepted
H 2.3: “Other things being equal, firms with a better <i>financial health</i> have a lower level of Real earnings management and a higher level of Accrual-based earnings management”	Partially accepted (influence on REM only is observed)
H 2.4: “Other things being equal, firms with higher <i>institutional ownership</i> have a lower level of Real earnings management and a higher level of Accrual-based earnings management”	Cannot be accepted nor rejected
H 2.5: “Other things being equal, acceptance of <i>Corporate Governance Code</i> in Russia in 2014 led to a higher usage of Real earnings management and a lower usage of Accrual-based earnings management”	Rejected
H 2.6: “Other things being equal, when <i>economic conditions</i> are favorable firms prefer to use Accrual-based earnings management rather than Real earnings management.”	Accepted
Timing of real and accrual-based earnings management	
H3: “Real earnings management and Accrual-based earnings management are used sequentially; managers adjust the amount of Accrual-based earnings management depending on the outcome of Real earnings management”	Accepted
Earnings management and corporate performance	
H4: “Real earnings management is detrimental to subsequent company performance and its influence is more adverse as compared to Accrual-based earnings management”	Partially accepted

Empirical results showed that companies, whose earnings are slightly above zero or slightly higher than previous year earnings, show signs of upwards earnings management. It implies that managers at Russian companies tend to avoid showing losses or earnings decreases, and are ready to utilize earnings management strategies to step over the benchmark. Moreover, it was revealed

that if managers need to meet zero earnings benchmark, they prefer to use real earnings management. However, if there is a need to meet a last year earnings benchmark, the preference is given to accrual-based earnings management. The obtained results are in line with multiple research conducted in other countries.

These findings might be interesting for the current shareholders and potential investors who rely on IFRS reports in their analysis. If earnings are too close to benchmarks, there is a high probability that the actual earnings are not what they look like. Hence, a more thorough analysis of financial statements is called for. Boards might also consider to challenge their managers tougher, if earnings are just above zero. In this case, it is highly likely that real earnings management was used, a strategy that is detrimental to subsequent company performance and value. Auditors of IFRS reports should also express more cautions if the preliminary unaudited earnings are slightly above the benchmarks.

Next, it was shown that real and accrual-based earnings management have a substitutive nature and that there are systematic as well company specific factors influencing the propensity to use either strategy. In the context of Russia, these factors are accounting flexibility, company financial health and external economic environment. Managers use accrual-based earnings management to greater extent and real earnings management to lesser extent when economy is growing and general economic conditions are favorable. Likewise, if a company is financially stable, managers tend to avoid real earnings management. Accounting flexibility is another factor, and companies with inflated accruals (due to earnings manipulation in previous periods) and with longer operating cycles show a higher level of real earnings management and a lower level of accrual-based earnings management.

No conclusion could be made regarding the influence of audit quality and institutional ownership, as in this setting the variables turned out to be insignificant. The possible reason might be hidden in the relative homogeneity of the data sample in regards to these characteristics. Besides, when audit quality is concerned, non-Big 4 audit firms might also be showing a high quality of audit comparable to that of Big4 firms.

It was shown that both strategies are used in a sequence: real earnings management is used first until the year-end, and after the fiscal year-end managers use accrual-based earnings management to fine tune the result. Therefore, the magnitude of accrual-based earnings management depends not only on the above-mentioned factors but also on the outcome of real earnings management.

These findings might be helpful for researchers, since they reinforce the need to study accrual and real earnings management in combination. Due to their substitutive nature, investigating only one strategy in isolation, as it is frequently done, might not show a big picture and might lead to false conclusions.

Investors, other users of financial reports and auditors might consider these factors as an extra hint that points at the area that needs a close look. For example, when a firm is growing and industry conditions are favorable, it might pay off to closer investigate the accruals (e.g., accounts receivable and unearned revenue accounts), as in this setting, accrual-based earnings management is more likely to be used. Besides, the absence of significant association between certain factors and earnings management also have some interesting insights. For example, the potential earnings distortion found in IFRS reports produced by non-Big4 auditors may be not materially different from earnings distortion in the reports audited by Big4 auditors. The same concerns audit tenure: frequency of auditor rotation showed no significant relationship with earnings quality.

The finding on the association between the enactment of Corporate Governance Code (CGC) and earnings management might be interesting for regulators. As regression results showed, in a post-CGC period, after 2015, the level of real earnings management fell, while that of accrual-based earnings management rose. Taking into account that corporate governance system is a restraining force for earnings management, the findings showed that Corporate Governance Code actually works as intended. The level of real earnings management, the most distracting for company value, appears to go down.

Also, it is important to note that regulations cannot completely eliminate earnings management. Pushed by strong incentives to manipulate earnings, managers will always find a way to do so, and would merely switch from one method to another. In USA, the reverse situation occurred when after Sarbanes-Oxley Act managers switched to real earnings management. In a survey, managers admitted that they are ready to use real earnings management even if it entails a sacrifice of a company value. These two observations combined together open a room for an interesting discussion. What is better for investment community:

- stricter regulations that provide for compliance with accounting standards but lead to a higher real earnings management, that might undermine a company profitability,

or

- more lenient regulations, that leave some space for accrual-based earnings management, but focus on corporate governance that in the end reduces real earnings management?

Finally, there was detected a statistically significant negative relationship between real earnings management and operating performance, operationalized via ROA adjusted for industry median. However, no conclusion was made regarding the accrual-earnings management and its relative influence on performance as compared to the real earnings management. These findings generally support the theorem that real earnings management is detrimental for subsequent performance.

Industry analysis revealed similar patterns. Companies from “Energy” and “Basic materials” sectors which heavily practiced real earnings management had a weaker next year profitability as compared to profitability of the companies less involved in real earnings management. These two sectors together represent a third of the whole sample. Accrual-based earnings management also showed negative influence on profitability but only for the “Consumer Non-Cyclicals” sector. Since this sector makes up only 10% of the whole sample and since relationship between AEM and performance for other sectors is not significant, overall, the association between the accrual-earnings management and performance is not significant as well.

The results might be helpful for management and board members. Managers are advised to keep in mind that utilizing real earnings management today might have a long-run implications and drag on the next year company profitability. Board members are also recommended to tighten oversight in relation to real earnings management practices.

It is interesting to see how these findings are reinforced in the results of testing hypotheses 1 and 2. In course of testing hypothesis 1, it was revealed that managers, when in need to meet last year earnings benchmarks do not use real earnings management. Only 14% of the firm-years, when earnings were just above last-year earnings, correspond to firm-years, when earnings are just above 0. In other words, these are generally profitable companies which did not extensively use real earnings management. Besides, in course of testing hypothesis 2, it was shown that firms with a better financial health are less inclined to use real earnings management. It invokes a thought that managers, particularly at the companies with solid financial performance, prefer not to use real earnings management being aware of its negative consequences.

2.5. Limitations of the study and potential for further research

This study is not free of limitations and the main of them lies with the models for estimation of earnings management proxies. The proxies were measured using Modified Jones and Roychowdhury models, however their power to detect earnings management was not explicitly tested for the Russian market. It is possible that these are not the “best” models, and hence there might be imprecisions in the value of the proxies. At the same time, this problem uncovers a large

research gap and calls for the development of the models that will effectively estimate real and accrual-based earnings management in the Russian setting.

The next limitation is tied to the sample used in this research. The sample included only publicly traded companies and hence the results should not be extrapolated on all Russian companies, since public companies are under much closer oversight by various stakeholders and their attitude towards earnings management might be different from that of non-public companies.

The list of factors affecting earnings management that used in this research can be complemented with other factors, particularly the ones that characterize corporate governance. It would generate more recommendations for the companies and policy makers regarding the building of an effective corporate governance system.

The corporate performance was measured with ROA adjusted for industry median, however the study may be repeated with other metrics that proxy corporate performance as well as company value.

This study was focused on accrual and real earnings management in aggregate, however studying the specific instruments of either strategy would have immense practical importance for the managers, boards, investors, auditors and regulators. Generally, further studies might rely on the framework set forth in this research:

1. investigating the setting, in which a particular earnings management tool is used (e.g., earnings benchmarks)
2. investigating the factors that influence on the choice of an earnings management tool;
3. studying how a selected earnings management tool affects subsequent performance and company value.

CONCLUSION

The main goal of the thesis was to investigate the influence of earnings management on subsequent company performance, separately for accrual-based and real earnings management.

In order to reach the research goal and to form a better understanding on the phenomenon of Earnings management, the following interim objectives were completed:

1. establishing the presence of earnings management and determination of the setting, in which companies tend to manipulate with earnings;
2. discovering the relationship between earnings management strategies (accrual-based vs. real) and defining the factors that influence on choice of either strategy;
3. identification of the timing patterns in which earnings management strategies are used;
4. understanding how either of earnings management strategies affects subsequent corporate performance

On the way to complete these objectives, the first step was to develop a theoretical framework in order to form a solid understating on the topic and to get acquainted with the current state-of-art in the global research. At first, the concept of earnings management was defined, and the main motives for earnings management were determined. Next, the two earnings management strategies (accrual-based and real earnings management) were discussed with detailed description of techniques for both strategies with follow-up real world examples of their application. Then, discussion proceeded to the restraints for earnings management and factors behind the choice of an earnings management strategy. Theoretical part was finalized with the discussion of potential influence of earnings management on corporate performance. Development of theoretical framework helped to identify a research gap and formulate the research questions and hypotheses.

The second part of the work is devoted to research design and presentation of results. The research was based on IFRS data. The panel dataset comprised data on 170 Russian non-financial public companies collected over a decade between 2011 and 2020. Investigation of earnings management in Russia based on IFRS reports complements existing publications that are in their majority based on figures prepared under Russian Accounting Standards.

The first finding is that companies, whose earnings are slightly above zero (*earnings are in range 0 – 1% of lagged total assets*) or slightly higher than previous year earnings (*year-on-year change in earnings is in range 0 – 1% of lagged total assets*), show signs of upwards earnings management. Moreover, it was revealed that a need to meet zero earnings benchmark induces real earnings management behavior, while a last year earnings benchmark is associated with accrual-based earnings management. This research was the first attempt to find an association between

earnings management and earnings benchmarks in Russia. The main implication of the finding is a call for a more thorough analysis of financial statements if earnings are just above the benchmarks.

Next, it was revealed that real and accrual-based earnings management have a substitutive nature, and the choice of either strategy depends on accounting flexibility, company financial health and external economic and regulatory environment. Quality and tenure of external auditor, and institutional ownership showed no significant association with either of earnings management strategies, contrary to the expectations.

Then, it was revealed that both strategies are used in a sequence, with real earnings management used first until the year-end, and after the fiscal year end, managers might apply accrual-based earnings management to fine tune the result. But, the relative use of either strategies is still influenced by the factors described above and the magnitude of accrual-based earnings management additionally depends on the outcome of real earnings management.

These findings might pose interest for researches as well as for practitioners. Researches might pay attention to the substitutive nature of earnings management that advocates for the need to study both strategies in aggregate. Policy makers might note that regulations cannot completely eliminate earnings management as such. Hence, it might be worthwhile to decide whichever type is less harmful for investors and other stakeholders in order to frame legislation in a way as to maintain the balance among all stakeholders. Investors, board members and auditors might consider these factors as an extra hint that points at the area that needs a closer look in course of their analysis.

Finally, it was concluded that real earnings management negatively influences on subsequent operating performance, measured with ROA adjusted for industry median. However, no conclusion could be made regarding the accrual-earnings management and its relative influence as compared to real earnings management.

Industry analysis revealed similar patterns. Companies from “Energy” and “Basic materials” sectors which practiced real earnings management had a weaker industry-adjusted next year profitability as compared to profitability of the companies less involved in real earnings management. These two sectors taken together represent a third of the data sample. Accrual-based earnings management also showed negative influence on profitability but only for the “Consumer Non-Cyclicals” sector. However, since this sector makes up only 10% of the whole sample and since relationship between AEM and performance for other sectors is not significant, overall, the association between the accrual-earnings management and performance is not significant as well.

This research was the first attempt to investigate the association between earnings management and corporate performance in Russia. Moreover, the work provided additional evidence to the opportunistic view on earnings management and partly resolved an ongoing debate, whether earnings management is good or bad for the company, at least in regards to real earnings management. These results are mainly aimed at management and the boards. Managers might consider the potential implications of real earnings management for long-term company performance, when they plan to use one, while boards are recommended to tighten oversight in relation to real earnings management practices.

The study has a number of limitations, the major of which comes from imperfections in models for measuring earnings management proxies, which were not explicitly tested for the Russian market. Another limitation arises out of the sample that was limited only to public companies. These limitations offer wide opportunities for further research. Besides, it might be valuable to investigate other factors that might influence earnings management strategy choice not mentioned in this research, to verify association between earnings management and other performance / value metrics, and to narrow down the research to specific earnings management instruments.

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APPENDIXES

Appendix 1. List of Companies

Original Company name (in Russian)	Company name (English translation)
ПАО "Абрау – Дюрсо"	PJSC "Abrau – Dyurso"
ПАО "АФК "Система"	PJSC "AFK" Sistema"
ПАО "Аэрофлот – российские авиалинии"	PJSC "Aeroflot – Russian Airlines"
ПАО "Рос Агро"	PJSC "Ros Agro"
ПАО "Акрон"	PJSC "Akron"
ПАО "АЛРОСА"	PJSC "ALROSA"
ПАО "Ашинский металлургический завод"	PJSC "Ashinskij metallurgicheskij zavod"
ПАО "Аптечная сеть 36,6"	PJSC "Aptechnaya set' 36,6"
ПАО "Русская Аквакультура"	PJSC "Russkaya Akvakul'tura"
ПАО "Башнефть"	PJSC "Bashneft"
ПАО "Белуга Групп"	PJSC "Beluga Grupp"
ПАО "Башинформсвязь"	PJSC "Bashinformsvyaz"
ОАО "Белон"	OJSC "Belon"
ПАО "Бурятзолото"	PJSC "Buryatzoloto"
ПАО "Челябинский трубопрокатный завод"	PJSC "Chelyabinskij truboprokatnyj zavod"
ПАО "Северсталь"	PJSC "Severstal"
ПАО "Челябинский металлургический комбинат"	PJSC "Chelyabinskij metallurgicheskij kombinat"
ПАО "Центральный телеграф"	PJSC "Central'nyj telegraf"
ПАО "ДИОД"	PJSC "DIOD"
ПАО "Детский мир"	PJSC "Detskij mir"
ПАО "Дальневосточная энергетическая компания"	PJSC "Dal'nevostochnaya energeticheskaya kompaniya"
ПАО "Европейская Электротехника"	PJSC "Evropejskaya Elektrotehnika"
ПАО "ЭН+ ГРУП"	PJSC "EN+ GROUP"
ПАО "Энел Россия"	PJSC "Enel Russia"
ETALON GROUP PLC	ETALON GROUP PLC
EVRAZ PLC	EVRAZ PLC
ПАО "Федеральная сетевая компания Единой энергетической системы"	PJSC "Federal'naya setevaya kompaniya Edinoj energeticheskoy sistemy"
ПАО "Дальневосточное морское пароходство"	PJSC "Dal'nevostochnoe morskoe parohodstvo"
Fix Price Group LTD	Fix Price Group LTD
ПАО "Современный коммерческий флот"	PJSC "Sovremennyj kommercheskij flot"
ПАО "ГАЗ"	PJSC "GAZ"
ПАО "Газпром"	PJSC "Gazprom"
ПАО "Группа Черкизово"	PJSC "Gruppa Cherkizovo"
ПАО "Международный Медицинский Центр Обработки и Криохранения Биоматериалов"	PJSC "Mezhdunarodnyj Medicinskij Centr Obrabotki i Kriohraneniya Biomaterialov"
GLOBAL PORTS INVESTMENTS PLC	GLOBAL PORTS INVESTMENTS PLC
Globaltrans Investment PLC	Globaltrans Investment PLC

ПАО "Горно-металлургическая компания "Норильский никель"	PJSC "Gorno-metallurgicheskaya kompaniya "Noril'skij nikel"
ПАО "ГЛОБАЛТРАК МЕНЕДЖМЕНТ"	PJSC "Globaltruck Management"
ПАО "ГЕОТЕК Сейсморазведка"	PJSC "GEOTEK Sejsmorazvedka"
HeadHunter Group PLC	HeadHunter Group PLC
ПАО "Химпром"	PJSC "Himprom"
HMS HYDRAULIC MACHINES & SYSTEMS GROUP PLC	HMS HYDRAULIC MACHINES & SYSTEMS GROUP PLC
ПАО "РусГидро"	PJSC "RusGidro"
ПАО "ИНВЕСТ-ДЕВЕЛОПМЕНТ"	PJSC "INVEST-DEVELOPMENT"
ПАО "Ижсталь"	PJSC "Izhstal"
ПАО "ИНГРАД"	PJSC "INGRAD"
ПАО "Интер РАО ЕЭС"	PJSC "Inter RAO EES"
ПАО "Иркутскэнерго"	PJSC Irkutskenergo
ПАО "Научно-производственная корпорация "Иркут"	PJSC "Nauchno-proizvodstvennaya korporaciya "Irkut"
ПАО "Институт Стволовых Клеток Человека"	PJSC "Institut Stvolovyh Kletok CHeloveka"
ПАО "Славнефть-Ярославнефтеоргсинтез"	PJSC "Slavneft'-Yaroslavnfteorgsintez"
ПАО "КуйбышевАзот"	PJSC "KujbyshevAzot"
ПАО "ТНС энерго Кубань"	PJSC "TNS energo Kuban"
ПАО "Камчатскэнерго"	PJSC "Kamchatskenergo"
ПАО "Курганская генерирующая компания"	PJSC "Kurganskaya generiruyushchaya kompaniya"
ПАО "Калужская сбытовая компания"	PJSC "Kaluzhskaya sbytovaya kompaniya"
ПАО "КАМАЗ"	PJSC "KAMAZ"
ПАО "Ковровский механический завод"	PJSC "Kovrovskij mekhanicheskij zavod"
ПАО "Красный Октябрь"	PJSC "Krasnyj Oktyabr"
ПАО "Кокс"	PJSC "Koks"
ПАО "Россети Кубань"	PJSC "Rosseti Kuban"
ПАО "Краснокамский завод металлических сеток"	PJSC "Krasnokamskij zavod metallicheskih setok"
ПАО "Органический синтез"	PJSC "Organicheskij sintez"
ПАО "Фармсинтез"	PJSC "Farmsintez"
ПАО "Нефтяная компания "ЛУКОЙЛ"	PJSC "Neftyanaya kompaniya "LUKOIL"
ПАО "Лента"	PJSC "Lenta"
ПАО "Лензолото"	PJSC "Lenzoloto"
ОАО "Липецкая энергосбытовая компания"	OJSC "Lipeckaya energosbytovaya kompaniya"
ПАО "Россети Ленэнерго"	PJSC "Rosseti Lenenergo"
ПАО "Группа ЛСР"	PJSC "Gruppa LSR"
ОАО "Левенгук"	OJSC "Levenguk"
ПАО "Магаданэнерго"	PJSC "Magadanenergo"
ПАО "Магнитогорский металлургический комбинат"	PJSC "Magnitogorskij metallurgicheskij kombinat"
Mail.ru Group Ltd	Mail.ru Group Ltd
MD MEDICAL GROUP INVESTMENTS PLC	MD MEDICAL GROUP INVESTMENTS PLC

ПАО "Славнефть - Мегионнефтегаз"	PJSC "Slavneft' - Megionneftegaz"
ПАО "МегаФон"	PJSC "MegaFon"
ПАО "Магнит"	PJSC "Magnit"
ПАО "Московская городская телефонная сеть"	PJSC "Moskovskaya gorodskaya telefonnaya set'"
ПАО "ТНС энерго Марий Эл"	PJSC "TNS energo Marij El"
ПАО "Морион"	PJSC "Morion"
ПАО "Россети Центр"	PJSC "Rosseti Centr"
ПАО "Россети Северный Кавказ"	PJSC "Rosseti Severnyj Kavkaz"
ПАО "Россети Центр и Приволжье"	PJSC "Rosseti Centr i Privolzh'e"
ПАО "Россети Сибирь"	PJSC "Rosseti Sibir'"
ОАО "Межрегиональная распределительная сетевая компания Урала"	OJSC "Mezhregional'naya raspredelitel'naya setevaya kompaniya Urala"
ПАО "Россети Волга"	PJSC "Rosseti Volga"
ПАО "Россети Юг"	PJSC "Rosseti YUg"
ПАО "Россети Северо-Запад"	PJSC "Rosseti Severo-Zapad"
ПАО "Мосэнерго"	PJSC "Mosenergo"
ПАО "Россети Московский регион"	PJSC "Rosseti Moskovskij region"
ОАО "Мультисистема"	OJSC "Mul'tisistema"
ПАО "МОСТОТРЕСТ"	PJSC "MOSTOTREST"
ПАО "Мечел"	PJSC "Mechel"
ПАО "Мобильные ТелеСистемы"	PJSC "Mobil'nye TeleSistemy"
ПАО "М.видео"	PJSC "M.video"
ПАО "НПО "Наука"	PJSC "NPO "Nauka"
ПАО "Новороссийский комбинат хлебопродуктов"	PJSC "Novorossijskij kombinat hleboproduktov"
ПАО "Нижнекамскнефтехим"	PJSC "Nizhnekamskneftekhim"
ПАО "Нижнекамскшина"	PJSC "Nizhnekamskshina"
ПАО "Новолипецкий металлургический комбинат"	PJSC "Novolipeckij metallurgicheskij kombinat"
ПАО "Новороссийский морской торговый порт"	PJSC "Novorossijskij morskoy trgovyj port"
ПАО "ТНС энерго Нижний Новгород"	PJSC "TNS energo Nizhnij Novgorod"
ОАО "НПО "Физика"	OSJ "NPO "Fizika"
ПАО "Наука-Связь"	PJSC "Nauka-Svyaz'"
ПАО "НОВАТЭК"	PJSC "NOVATEK"
ПАО "Медиахолдинг"	PJSC "Mediaholding"
ПАО "Вторая генерирующая компания оптового рынка электроэнергии"	PJSC "Vtoraya generiruyushchaya kompaniya optovogo rynka elektroenergii"
АО О'КЕЙ ГРУПП	JSC "O'KEJ GROUP "
ПАО "ОР ГРУПП"	PJSC "OR GROUP"
Озон Холдингс ПиЭлСи	Ozon Holdings PiElSi
ПАО "ФосАгро"	PJSC "FosAgro"
ПАО "ПИК-специализированный застройщик"	PJSC "PIK-specializirovannyj zastrojshchik"
X5 Retail Group N.V.	X5 Retail Group N.V.
ПАО "Полус"	PJSC "Polyus"

ПАО "Пермская энергосбытовая компания"	PJSC "Permskaya energosbytovaya kompaniya"
POLYMETAL INTERNATIONAL PLC	POLYMETAL INTERNATIONAL PLC
ПАО "Челябинский завод профилированного стального настила"	PJSC "CHelyabinskij zavod profilirovannogo stal'nogo nastila"
ПАО "Распадская"	PJSC "Raspadskaya"
ПАО "РБК"	PJSC "RBK"
ПАО "Ракетно-космическая корпорация "Энергия"	PJSC "Raketno-kosmicheskaya korporaciya "Energiya"
ПАО "Группа Компаний "Роллман"	PJSC "Gruppa Kompanij "Rollman"
ПАО Нефтегазовая компания "РуссНефть"	PJSC Neftegazovaya kompaniya "RussNeft"
ПАО "Русолово"	PJSC "Rusolovo"
ПАО "Нефтяная компания "Роснефть"	PJSC "Neftyanaya kompaniya "Rosneft"
ПАО "РОСИНТЕР РЕСТОРАНТС ХОЛДИНГ"	PJSC "ROSINTER RESTORANTS HOLDING"
ПАО "Российские сети"	PJSC "Rossijskie seti"
ПАО "Ростелеком"	PJSC "Rostelekom"
ПАО "ТНС энерго Ростов-на-Дону"	PJSC "TNS energo Rostov-na-Donu"
ПАО "РУСАЛ"	PJSC "RUSAL"
ПАО "Русгрэйн Холдинг"	PJSC "Rusgrejn Holding"
ПАО "Русполимет"	PJSC "Ruspolimet"
ПАО "Селигдар"	PJSC "Seligdar"
ПАО Группа компаний "Сегежа"	PJSC Gruppa kompanij "Segezha"
ПАО "Газпром нефть"	PJSC "Gazprom нефть"
ПАО "Сахалинэнерго"	PJSC "Sahalinenergo"
ПАО "Группа компаний "Самолет"	PJSC "Gruppa kompanij "Samolet"
ПАО "Сургутнефтегаз"	PJSC "Surgutneftegaz"
ПАО "СОЛЛЕРС Авто"	PJSC "SOLLERS Avto"
ПАО "Татнефть" имени В.Д. Шашина	PJSC "Tatneft" imeni V.D. SHashina
ПАО "Территориальная генерирующая компания №1"	PJSC "Territorial'naya generiruyushchaya kompaniya №1"
ПАО "Территориальная генерирующая компания №2"	PJSC "Territorial'naya generiruyushchaya kompaniya №2"
ПАО "Квадра - Генерирующая компания"	PJSC "Kvadra - Generiruyushchaya kompaniya"
ПАО "Территориальная генерирующая компания № 14"	PJSC "Territorial'naya generiruyushchaya kompaniya № 14"
ПАО Группа компаний "ТНС энерго"	PJSC Gruppa kompanij "TNS energo"
ПАО "Томская распределительная компания"	PJSC "Tomskaya raspreditel'naya kompaniya"
ПАО "Центр по перевозке грузов в контейнерах "ТрансКонтейнер"	PJSC "Centr po perevozke грузов v kontejnerah "TransKontejner"
ПАО "Трубная Металлургическая Компания"	PJSC "Trubnaya Metallurgicheskaya Kompaniya"
ПАО "Таттелеком"	PJSC "Tattelekom"
ПАО "Угольная компания "Южный Кузбасс"	PJSC "Ugol'naya kompaniya "YUzhnyj Kuzbass"

ПАО "Объединенная авиастроительная корпорация"	PJSC "Ob"edinennaya aviastroitel'naya korporaciya"
ПАО "Южно-Уральский никелевый комбинат"	PJSC "YUzhno-Ural'skij nikelovyj kombinat"
ПАО "Юнипро"	PJSC "YUnipro"
ПАО "Уралкалий"	PJSC "Uralkalij"
ПАО "Уральская кузница"	PJSC "Ural'skaya kuznica"
ПАО "Авиакомпания "ЮТэйр"	PJSC "Aviakompaniya "YUTEjr"
ПАО "Научно-производственная корпорация "Объединенная Вагонная Компания"	PJSC "Nauchno-proizvodstvennaya korporaciya "Ob"edinennaya Vagonnaya Kompaniya"
ПАО "ННК-Варьеганнефтегаз"	PJSC "NNK-Var'eganneftegaz"
ПАО "Владимирский химический завод"	PJSC "Vladimirskij himicheskij zavod"
VEON Ltd.	VEON Ltd.
ПАО "ТНС энерго Воронеж"	PJSC "TNS energo Voronezh"
ПАО "Корпорация ВСМПО-АВИСМА"	PJSC "Korporaciya VSMPO-AVISMA"
ПАО "Выборгский судостроительный завод"	PJSC "Vyborgskij sudostroitel'nyj zavod"
ПАО "Центр международной торговли"	PJSC "Centr mezhdunarodnoj trgovli"
ПАО "Якутская топливно-энергетическая компания"	PJSC "YAkutskaya toplivno-energeticheskaya kompaniya"
ПАО "Якутскэнерго"	PJSC "YAkutskenergo"
Yandex N.V.	Yandex N.V.
ПАО "ТНС энерго Ярославль"	PJSC "TNS energo YArosavl'"
ПАО "Завод имени И.А. Лихачева"	PJSC "Zavod imeni I.A. Lihacheva"
Petropavlovsk PLC	Petropavlovsk PLC

Appendix 2.1. Correlation matrix: variables used in models to test Hypotheses 1.1. – 1.2.

Variables	<i>REM</i>_{<i>i,t</i>}	<i>AEM</i>_{<i>i,t</i>}	<i>JustMeet0</i>_{<i>i,t</i>}	<i>JustMeetLY</i>_{<i>i,t</i>}	<i>LnAssets</i>_{<i>i,t</i>}	<i>MtoB</i>_{<i>i,t</i>}	<i>ROA</i>_{<i>i,t</i>}
<i>REM</i>_{<i>i,t</i>}	1						
<i>AEM</i>_{<i>i,t</i>}	0.130**	1					
<i>JustMeet0</i>_{<i>i,t</i>}	0.119**	0.033	1				
<i>JustMeetLY</i>_{<i>i,t</i>}	0.024	0.080**	0.066*	1			
<i>LnAssets</i>_{<i>i,t</i>}	-0.067*	-0.038	-0.095**	0.032	1		
<i>MtoB</i>_{<i>i,t</i>}	-0.02	0.004	-0.075**	-0.061*	0.005	1	
<i>ROA</i>_{<i>i,t</i>}	-0.235**	0.632**	-0.079**	0.02	0.179**	0.150**	1

*Note: *'s indicate the significance of the correlation coefficient. ** $p < 0.01$, * $p < 0.05$*

Appendix 2.2. Correlation matrix: variables used in models to test Hypotheses 2.1-2.6, 3

Variables	REM_{i,t}	AEM_{i,t}	Zscore_{i,t}	INST_{i,t}	Leverage_{i,t}	Big4_{i,t}	AUD_TE N_{i,t}	CGC_t	NOA_{i,t-1}	Cycle_{i,t}	ROA_{i,t}	LnAssetsInd Adj_{i,t}	MtoB_{i,t}	GDP_t	IncomePre EM_{i,t}
REM_{i,t}	1														
AEM_{i,t}	0.130**	1													
Zscore_{i,t}	-0.053	0.319**	1												
INST_{i,t}	0.124**	0.045	0.024	1											
Leverage_{i,t}	-0.019	-0.264**	-0.533**	0.064*	1										
Big4_{i,t}	-0.099**	-0.070**	-0.028	-0.141**	0.120**	1									
AUD_TEN_{i,t}	0.047	-0.029	0.103**	-0.044	0.081**	0.226**	1								
CGC_t	0.048	0.027	0.02	0.128**	0.073**	-0.164**	0.431**	1							
NOA_{i,t-1}	0.245**	-0.018	-0.160**	-0.008	-0.01	-0.073**	-0.046	0.004	1						
Cycle_{i,t}	0.307**	0.138**	0.050	-0.021	-0.025	-0.086**	0.028	0.031	0.093**	1					
ROA_{i,t}	-0.235**	0.632**	0.537**	-0.081**	-0.349**	0.144**	0.122**	0.011	-0.121**	0.015	1				
LnAssetsIndAdj_{i,t}	-0.084**	-0.025	-0.105**	-0.186**	-0.027	0.433**	0.190**	-0.044	0.034	-0.117**	0.140**	1			
MtoB_{i,t}	-0.02	0.004	0.307**	0.038	0.050	0.066*	0.183**	0.094**	-0.066*	0.033	0.150**	-0.009	1		
GDP_t	-0.053	0.126**	0.042	-0.072*	-0.066*	0.118**	-0.204**	-0.424**	-0.012	-0.018	0.117**	0.031	-0.038	1	
IncomePreEM_{i,t}	-0.957**	-0.132**	0.153**	-0.144**	-0.049	0.150**	0.005	-0.049	-0.232**	-0.289**	0.390**	0.135**	0.072*	0.056*	1

Note: *'s indicate the significance of the correlation coefficient. ** $p < 0.01$, * $p < 0.05$

Appendix 2.3. Correlation matrix: variables used in models to test Hypothesis 4

80th percentile threshold used to define variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$ and $BOTH_{d_{i,t}}$

Variables	ROA_Ind $Adj_{i,t+1}$	ROA_Ind $Adj_{i,t+2}$	ROA_Ind $Adj_{i,t+3}$	ROA_Ind $Adj_{i,t}$	$REM_{d_{i,t}}$	$AEM_{d_{i,t}}$	$BOTH_{d_{i,t}}$	$LnAssets_{i,t}$	$Zscore_{i,t}$	$MtoB_{i,t}$
$ROA_IndAdj_{i,t+1}$	1									
$ROA_IndAdj_{i,t+2}$	0.526**	1								
$ROA_IndAdj_{i,t+3}$	0.371**	0.519**	1							
$ROA_IndAdj_{i,t}$	0.528**	0.379**	0.366**	1						
$REM_{d_{i,t}}$	-0.182**	-0.149**	-0.095**	-0.273**	1					
$AEM_{d_{i,t}}$	0.109**	0.055	0.03	0.307**	-0.186**	1				
$BOTH_{d_{i,t}}$	0	0.008	-0.01	0.086**	-0.140**	-0.118**	1			
$LnAssets_{i,t}$	0.113**	0.124**	0.146**	0.131**	-0.136**	-0.036	-0.203**	1		
$Zscore_{i,t}$	0.399**	0.339**	0.289**	0.520**	-0.093**	0.093**	0.123**	-0.057*	1	
$MtoB_{i,t}$	0.149**	0.112**	0.105**	0.140**	-0.042	0.008	-0.016	0.005	0.307**	1

Note: *'s indicate the significance of the correlation coefficient. ** $p < 0.01$, * $p < 0.05$

67th percentile threshold used to define variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$, and $BOTH_{d_{i,t}}$

Variables	ROA_Ind $Adj_{i,t+1}$	ROA_Ind $Adj_{i,t+2}$	ROA_Ind $Adj_{i,t+3}$	ROA_Ind $Adj_{i,t}$	$REM_{d_{i,t}}$	$AEM_{d_{i,t}}$	$BOTH_{d_{i,t}}$	$LnAssets_{i,t}$	$Zscore_{i,t}$	$MtoB_{i,t}$
$ROA_IndAdj_{i,t+1}$	1									
$ROA_IndAdj_{i,t+2}$	0.526**	1								
$ROA_IndAdj_{i,t+3}$	0.371**	0.519**	1							
$ROA_IndAdj_{i,t}$	0.528**	0.379**	0.366**	1						
$REM_{d_{i,t}}$	-0.189**	-0.167**	-0.125**	-0.305**	1					
$AEM_{d_{i,t}}$	0.123**	0.086**	0.093**	0.329**	-0.251**	1				
$BOTH_{d_{i,t}}$	-0.005	-0.016	-0.021	0.079**	-0.245**	-0.219**	1			
$LnAssets_{i,t}$	0.113**	0.124**	0.146**	0.131**	-0.063*	0.033	-0.168**	1		
$Zscore_{i,t}$	0.399**	0.339**	0.289**	0.520**	-0.136**	0.144**	0.063*	-0.057*	1	
$MtoB_{i,t}$	0.149**	0.112**	0.105**	0.140**	-0.038	0.036	-0.057*	0.005	0.307**	1

Note: *'s indicate the significance of the correlation coefficient. ** $p < 0.01$, * $p < 0.05$

Appendix 3. Panel data models selection

H2: REM equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0000	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H2: AEM equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0001	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

80th percentile threshold used to define variables
 $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$, and $BOTH_{d_{i,t}}$

67th percentile threshold used to define variables
 $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$, and $BOTH_{d_{i,t}}$

H4: ROA_IndAdj_{i,t+1} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0188	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H4: ROA_IndAdj_{i,t+1} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0122	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H4: ROA_IndAdj_{i,t+2} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0000	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H4: ROA_IndAdj_{i,t+2} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0000	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H4: ROA_IndAdj_{i,t+3} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0000	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

H4: ROA_IndAdj_{i,t+3} equation

Test	p-value	Decision
F-test	0.0000	Fixed effects
LM test	0.0000	Random Effects
Hausman test	0.0000	Fixed effects
Final model choice		Fixed effects

Appendix 4. Variance Inflation Factors

H1: zero earnings benchmark

Variable	VIF
$ROA_{i,t}$	1.08
$LnAssets_{i,t}$	1.06
$MtoB_{i,t}$	1.03
$JustMeet0_{i,t}$	1.02

H1: last year earnings benchmark

Variable	VIF
$ROA_{i,t}$	1.07
$LnAssets_{i,t}$	1.05
$MtoB_{i,t}$	1.02
$JustMeetLY_{i,t}$	1.01

H2 - H3: REM equation

Variable	VIF
$INST_{i,t}$	6.47
$AUD_TEN_{i,t}$	5.64
CGC_t	4.60
$Big4_{i,t}$	4.56
$Leverage_{i,t}$	3.97
$Zscore_{i,t}$	3.94
$ROA_{i,t}$	2.06
$MtoB_{i,t}$	1.59
GDP_t	1.45
$IncomePreEM_{i,t}$	1.42
$LnAssetsIndAdj_{i,t}$	1.32
$Cycle_{i,t}$	1.26
$NOA_{i,t-1}$	1.14

H2 - H3: AEM equation

Variable	VIF
$INST_{i,t}$	6.80
$AUD_TEN_{i,t}$	5.77
CGC_t	4.62
$Big4_{i,t}$	4.55
$Zscore_{i,t}$	4.12
$Leverage_{i,t}$	4.09
$LnAssetsIndAdj_{i,t}$	3.01
$UnexpectedREM_{i,t}$	2.74
$PredREM_{i,t}$	2.56
$ROA_{i,t}$	2.00
$MtoB_{i,t}$	1.61
$Cycle_{i,t}$	1.46
GDP_t	1.45
$NOA_{i,t-1}$	1.33

80th percentile threshold used to define variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$, and $BOTH_{d_{i,t}}$

H4: ROA_IndAdj_{i,t+1}

Variable	VIF
$Zscore_{i,t}$	3.05
$LnAssets_{i,t}$	2.86
$ROA_IndAdj_{i,t}$	1.59
$MtoB_{i,t}$	1.53
$AEM_{d_{i,t}}$	1.34
$REM_{d_{i,t}}$	1.33
$BOTH_{d_{i,t}}$	1.14

H4: ROA_IndAdj_{i,t+2}

Variable	VIF
$Zscore_{i,t}$	3.15
$LnAssets_{i,t}$	2.96
$ROA_IndAdj_{i,t}$	1.60
$MtoB_{i,t}$	1.53
$AEM_{d_{i,t}}$	1.35
$REM_{d_{i,t}}$	1.33
$BOTH_{d_{i,t}}$	1.14

H4: ROA_IndAdj_{i,t+3}

Variable	VIF
$Zscore_{i,t}$	3.13
$LnAssets_{i,t}$	2.99
$ROA_IndAdj_{i,t}$	1.54
$MtoB_{i,t}$	1.57
$AEM_{d_{i,t}}$	1.34
$REM_{d_{i,t}}$	1.35
$BOTH_{d_{i,t}}$	1.14

67th percentile threshold used to define variables $REM_{d_{i,t}}$, $AEM_{d_{i,t}}$, and $BOTH_{d_{i,t}}$

H4: ROA_IndAdj_{i,t+1}

Variable	VIF
$LnAssets_{i,t}$	3.53
$Zscore_{i,t}$	2.97
$ROA_IndAdj_{i,t}$	1.58
$REM_{d_{i,t}}$	1.52
$AEM_{d_{i,t}}$	1.57
$MtoB_{i,t}$	1.53
$BOTH_{d_{i,t}}$	1.38

H4: ROA_IndAdj_{i,t+2}

Variable	VIF
$LnAssets_{i,t}$	3.70
$Zscore_{i,t}$	3.07
$ROA_IndAdj_{i,t}$	1.61
$REM_{d_{i,t}}$	1.54
$AEM_{d_{i,t}}$	1.59
$MtoB_{i,t}$	1.54
$BOTH_{d_{i,t}}$	1.38

H4: ROA_IndAdj_{i,t+3}

Variable	VIF
$LnAssets_{i,t}$	3.75
$Zscore_{i,t}$	3.06
$ROA_IndAdj_{i,t}$	1.56
$REM_{d_{i,t}}$	1.58
$AEM_{d_{i,t}}$	1.59
$MtoB_{i,t}$	1.58
$BOTH_{d_{i,t}}$	1.38